Elk Production

Economic and Production Information
for Saskatchewan Producers

Saskatchewan
Agriculture
and Food

Foreword

The objective of this publication is to help individuals assess the economic opportunity for establishing an elk farm. The information can be used by producers and investors as a guide for their own business plans. Producers should note that the information in this publication will require interpretation and adjustment for their individual situations.

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Introduction

Members of the deer family have been "farmed", or raised in captivity, for centuries in some parts of the world. Reference to the practice of game farming can be found in written records dating back 2,500 years in China and Siberia. Asian cultures have long used velvet antler products to maintain strength, energy and general good health. Velvet antler is often eaten as a delicacy, brewed in teas and included in various health products. In addition to the velvet antler products, venison (meat) is considered a delicacy and is a popular consumer product in several parts of the world.

Elk are native to North America and are a member of the *Cervidae*, or "deer" family. The species of elk native to Saskatchewan is specifically known as *Cervus elaphus canadensis*. Elk are also known as "wapiti", a Shawnee word referring to the white rump.

The commercial elk industry in Saskatchewan and Canada has experienced rapid growth in the past 10 years and is now recognized as a distinct and viable agricultural enterprise. Today, there are approximately 24,500 animals on over 370 farms in Saskatchewan.

Saskatchewan Game Farm Regulations

In Saskatchewan, the elk industry is governed by The Domestic Game Farm Animal Regulations which are administered by Saskatchewan Agriculture and Food (SAF). The following is a brief summary of some of the regulations. More information can be obtained from the Sustainable Production Branch and/or the Inspection and Regulatory Management Branch (IRM) of Saskatchewan Agriculture and Food.

- A licence is required to establish and/or operate a game farm. The initial licence fee is $200 and it is valid until December 31st of the fifth year. It is renewable thereafter for $150 every five years.
- It is illegal to trap Crown wildlife for stocking game farms.
- Import permits are required for live elk, embryos and semen entering Saskatchewan.
- All elk must be uniquely and permanently identified as prescribed by Saskatchewan Agriculture and Food by December 31st in the year in which they are born or prior to transport (whichever occurs first). The Saskatchewan Elk Breeders Association (SEBA) now has the authority to issue the government approved identification tag.
- The perimeter fence for the enclosure must be 2.1 metres (6 feet 10 inches) high and securely locked or latched to prevent public access to the enclosure and escape of animals.
- Wild elk must be removed from the fenced enclosure and written approval must be obtained from the game farm inspector prior to stocking with farmed elk.
- All game farm operators shall provide manifests or federal transportation authorization permits to purchasers of live animals. One of these permits must be carried with animals during transportation and copies of the manifests or transportation authorization permits must be submitted to SAF.
- Every game farm operator shall maintain and update a permanent written record of births, deaths and animal movements on and off farms, and submit the birth and death records annually to SAF.
- All farmed elk meat must be identified and labelled as prescribed by the regulation and records kept for all animals or products processed.

The Elk Industry

Industry Overview

Increasingly tight margins in many sectors of agriculture have prompted many producers to examine alternative agricultural ventures. Elk production is one of the industries that in the past 10 years has emerged as an alternative to the traditional agricultural enterprises.

Industry estimates show the global domestic "deer" population to be in excess of five million animals, with the largest producers being New Zealand, Russia and China. Actual usage may be as high as 30 million animals when one takes into account the wild world populations. Canada accounts for only a small percentage of global deer production. In Canada, the distribution of farmed elk is largely determined by the provincial laws and regulations established to control this industry. Elk cannot be raised in all provinces. The largest numbers of farmed elk are found in Alberta and Saskatchewan whose combined elk populations comprise approximately 87% of the national industry (Table 1).

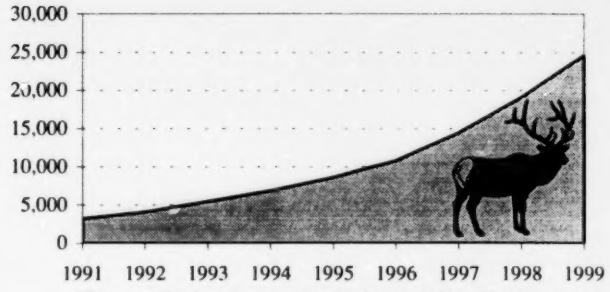
Table 1: Canadian Farmed Elk Herd (1999).

Region	Total Number	% of Total
Saskatchewan	**24,573**	**42.7%**
Alberta	25,629	44.5%
Ontario	3,300	5.7%
Manitoba	2,000	3.5%
Québec	1,900	3.3%
Yukon	150	0.3%
Canadian Total	57,552	100%

(Source: Provincial and Federal agencies)

Currently, the most profitable returns for Saskatchewan producers are associated with the production of breeding stock, trophy bulls and velvet antler. Once populations have reached a level where breeding stock demands are met, venison will be available to supply meat markets.

Figure 1: Growth of the Saskatchewan farmed Elk Herd.



(Source: Saskatchewan Agriculture & Food estimates)

Market Supply

The farmed elk herd is relatively small in Canada with only 57,552 animals in the entire country. The majority of these are found in Alberta and Saskatchewan whose herds account for approximately 45 and 43 percent of the national herd, respectively. Elk farming is growing rapidly in many areas of Canada, and especially in Saskatchewan (Figure 1). This rapid expansion means that the Canadian demand for breeding stock, velvet bulls and trophy bulls is expected to be greater than the supply for the near future.

The other three primary markets, velvet antler, venison and trophy bulls, must be examined on a global basis. The deer farming industry is well-established in certain areas of the world, unlike Canada where it is still in its infancy. The three major velvet antler-producing areas in the world today are New Zealand, China and some of the independent states of the former Soviet Union. New Zealand is currently the largest single exporter of farmed venison while Russia is the largest exporter of total venison. Other areas with significant levels of venison production include Poland, Hungary and several other Eastern European countries.

Product

In Canada, at the current time, the three primary products of elk production are breeding stock, velvet antler and trophy bulls. Venison is an additional product that will become increasingly important over time. Breeding stock is generally sold as heifer calves, exposed heifers or exposed cows. There is also a demand for breeding bulls with superior genetics and, in the past few years, there have been considerable advances in reproductive technologies such as semen collection, artificial insemination (AI) and embryo transfer.

Velvet Antler

Velvet antler is a product that is harvested annually from the bulls. Velvet antler refers to the entire antler when it is in the growth phase. At this stage it is soft and lacks the mineralized characteristics of hard antler. The quantity harvested will depend on the genetics of the animal, the age of the animal and the timing of harvesting. The highest prices are obtained for velvet antler that is large and is harvested before the calcification or hardening process begins.

Table 2: Average Annual Velvet Antler Harvest by Bull Age.

Age of Elk Bull	Average Velvet Production per Bull (lb.)
Spikers (yearlings)	2.54
2 yr. old	7.63
3 yr. old	10.83
4 yr. old	14.32
5 yr. old	16.22
6 yr. old	18.15
7 yr. and older	18.84

(Source: Alberta Agriculture, Food & Rural Development, 1998)

The velvet harvesting season runs from about the last week in May until late June. The timing of cutting depends upon the age of the bull: older bulls shed their 'buttons' earlier than younger ones. "Button drop" refers to the time when the antler stubs from the previous year are shed. Mature elk are generally ready to harvest 65-75 days after their buttons drop. Harvesting after this period may result in substantially lower prices for the resulting velvet antler.

Antlers in the velvet stage are generally harvested for the first time in the second year of a bull's life and annually thereafter. After harvesting, lay the antler along the long length of the beam with the cut end slightly elevated (approx. 15 degrees). This position will minimize distortion during the freezing process. Do not hang the antler during freezing.

Traditionally, the velvet antler has then been sold as a "green" product in its frozen state. However, there are processing plants in Canada that will dry velvet antler for producers so that it may be marketed as a dry or further processed product (see Appendix II).

If producers elect to store their frozen product, they should ensure that the frozen product does not dry out or suffer "freezer-burn". Freezer-burn will have a detrimental effect on quality and the price of the product. Walk-in freezers tend to dry out antlers quicker than chest freezers. Frozen green velvet antler should be dried within one year of harvest to prevent a decrease in quality.

Venison

Elk venison is not widely available in Canada at the current time due to the high demand for breeding stock and velvet antler production. The venison that is available is

sold either as a farmgate product or into speciality markets such as gourmet restaurants. Regulations are in place to ensure that only farm-raised elk meat will enter the marketplace. Producers considering selling elk meat should contact the Inspection and Regulatory Management Branch of SAF to ensure that all of the current regulations governing the sale of elk are met. The names of several meat processors and wholesalers who currently handle elk meat are included in Appendix II.

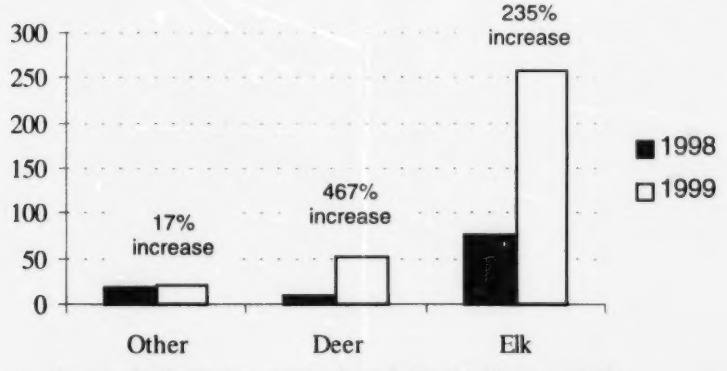
Trophy Bulls

An additional source of income from elk production is the sale of "trophy bulls". Top quality, mature bulls from either the breeding herd or velvet herd will have large antlers, and may be sold to ranches that specialize in hunting. The majority of trophy ranches are located in the United States; however, a few operate in Canada. The appropriate permits will need to be obtained to transport and export animals.

In general, elk bulls reach their peak trophy potential between four and seven years of age, and can be assessed for trophy potential at around three or four years. There is a large window of time for harvesting trophy bulls, with many operators harvesting between September and January. There has been a considerable under-supply of trophy quality bulls across North America for the past 10 years, and all indications are that this will continue to be the situation. There is considerable optimism in the Saskatchewan elk industry with the recent changes in the regulations to allow trophy ranching in Saskatchewan. Figure 2 shows the initial growth of the Saskatchewan trophy ranching industry (NOTE: Included in the deer category are white-tailed deer, mule deer and fallow deer).

Trophy bulls are evaluated and sold on the basis of the Boone & Crockett score of their antlers. This scoring system is a standardized method to determine the overall number of inches of antler the bull possesses. There are two general classes of trophy antlers: typical and non-typical. This determination is based upon the symmetry of the antlers and how closely they resemble the idealized antler conformation. The value of the trophy animal is primarily related to the score of the antler. Other factors such as body size and colour have little influence on the market value; however, they should not be discounted altogether in an effective marketing plan.

Figure 2: Saskatchewan Trophy Ranch Harvest.



(Source: Saskatchewan Agriculture & Food estimates, 1999)

Market Demand

As with any product or commodity, it is imperative that producers implement a successful marketing strategy. This is especially true when one considers that several of the key markets for elk products are yet to be fully developed.

Breeding Stock

The demand for breeding stock continues to outpace the current supply, thereby making breeding stock the most profitable market at present. The Canadian elk herd has expanded rapidly from almost nil in 1989 to over 55,000 animals in 1999. In Saskatchewan, the elk industry has grown from only seven farms in 1986 to over 370 farms in 1999. It is anticipated that the demand for breeding stock will remain strong for the next few years.

Venison Market

Another opportunity that exists for elk products is the venison market. Until breeding stock, velvet bull and trophy bull demand begins to stabilize, it is likely that only barren cows and cull bulls will be processed as meat. However, venison is a popular consumer product in several areas of the world, with Russia, China and the European countries being the largest consumers. Canada currently consumes 2 billion pounds of beef annually (Table 3). If even a small fraction of this market can be captured by venison, it will create a large new market for elk products. Venison is a red meat that is lower in fat and cholesterol than beef and has a similar protein content (Table 4). These characteristics should make venison an appealing product to the health-conscious consumer.

Table 3: 1998 Canadian Consumption of Various Meat Products.

Item	Consumption	
	Total ('000 lb.)	Per Capita (lb.)
Beef	2,051,913	97.7
Pork	1,803,840	59.5
Chicken	1,881,839	62.2
Turkey	283,786	9.3
Lamb/Mutton	53,409	1.8
Veal	89,653	2.9
Venison	**678**	**0.022**

(Source: Statistics Canada and Industry estimates)

Young bulls (15 - 27 months) will have a dressed carcass weight of approximately 339 pounds (154 kg.). Heifers of the same age will have a dressed carcass weight of approximately 267 pounds (121 kg.). These values assume a dressing percentage of 55%. Appendix VI discusses elk carcass weights in further detail.

Table 4: Comparison of Nutrient Composition of Various Animal Products.

Per 100 gram Portion	Calories	Fat (g)	Cholesterol (mg)	Protein (g)
Venison, loin cut	**159**	**3.30**	**66**	**25**
Beef, bottom round & lean	214	9.76	92	31
Ground Beef	265	18.40	85	24
Pork shoulder cut & lean	219	10.64	101	29
Lamb leg roast & lean	178	7.62	83	25
Veal cutlet	213	10.35	125	26
Chicken breast	159	3.42	83	31
Turkey (light meat)	154	3.45	68	29
Salmon (pink)	138	5.75	39	20
Scallops (breaded)	215	11.00	77	17

(Source: New Zealand Game Industry Board)

Velvet Antler Market

Korea has traditionally been the largest elk velvet antler market, with almost all of the Canadian production being sold there. Another significant market is China, which is expected to become the world's leading importer in the near future.

The international trade of all sources of velvet antler is estimated to be over $1.5 billion (retail). It is estimated that the 1999 velvet sales in Saskatchewan were $4.5 million. In 1999, it is estimated that Canada ranked third in velvet antler exports, behind New Zealand and Russia.

The economic downturn of many Asian countries in 1997-98 greatly affected the global price of velvet antler. The traditional demand for velvet continued, but the economic circumstances discouraged the importation of velvet. As the Asian countries continue to prosper, the demand for velvet antler is expected to increase sharply.

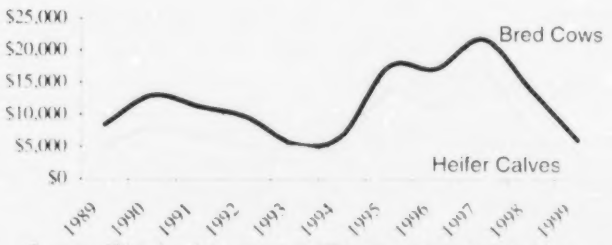
The Asian economic downturn prompted investigation into developing domestic markets for velvet antler along with venison and trophy markets. Markets are also emerging in other areas of the world, including North America, as people become more health-conscious and begin to examine the possible health benefits of velvet antler.

Price

Breeding Stock

As with most commodities, the price of elk and elk products is largely determined by the quality. Genetics, management practices, age and health all contribute to quality breeding stock. Young bred cows will normally bring the top price, with bred heifers and heifer calves following in that order. The prices have declined in recent years from a high of $21,000 in 1996 for bred cows to approximately $6,000 in 1999 (Figure 3). This is due in part to the decline in velvet antler demand over the same period.

Figure 3: Historical Auction Prices of Female Elk.



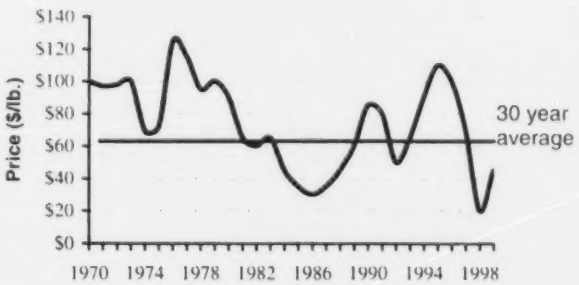
(Source: Weighted Averages of Western Canadian Public Auction Results)

Studies estimate that 35% of the variability in velvet antler weight is genetic in origin, which makes it a moderately high heritable trait. Considerable progress can be achieved by genetic selection. Certain bloodlines within the industry are becoming known for the production of large quantities of velvet antler. As a result, animals of these bloodlines command top sale prices.

Velvet

The global demand as well as quality of the velvet antler itself determine velvet prices. The greatest single factor in determining velvet antler quality is the timing of the harvest. If the velvet antler is harvested too early, the yield will be lower as will be the associated returns. Conversely, harvesting the velvet antler once it is past its prime will result in a lower quality product, and a lower

Figure 4: Historical Top-Quality Velvet Antler Prices (Mature Bulls).



(Source: Industry sources and Velvet Processing Facilities)

price per pound. There are no formal standards applied to velvet antler. Buyers will inspect every purchase and evaluate the following criteria for negotiating a price:

- Weight
- Beam diameter
- Degree of calcification
- Blood content
- Symmetry and uniformity
- Balance (top half larger than bottom half)
- Damage

The price of velvet antler has been extremely volatile over the past 15 years. Industry price quotes show the average 1993 price at approximately $65/lb. ($143/kg.), in a "green" frozen state. In 1996, the average green velvet antler price was $100/lb. ($220/kg.). The production of velvet antler should be viewed as a long-term enterprise due to the volatility of pricing. The average price over the past 30 years is approximately $74/lb. with the past 10-year average being $72/lb. and the last five year average being $69/lb. Refer to Figure 4 for historical prices for top quality green velvet antler.

Venison

It is difficult to determine a market price for elk meat as there has been very little available. The meat is often sold as a farmgate product. Elk carcasses have been wholesaling in the range of $3.50 per pound.

Trophy Bulls

The price of trophy bulls will be directly determined by the antler Boone & Crockett (B&C) point score. Animals with antlers scoring above 320" B&C are sought after. A bull with antlers that score 380" B&C is considered to be a very large trophy. Trophy bulls with antlers of superior size may command prices as high as $20,000 per animal, making this an attractive alternative market for elk producers. While recent regulatory changes have allowed hunt ranches in Saskatchewan, the majority are located in the United States.

Promotion & Distribution

The individual producers have historically done the marketing of breeding stock and velvet bulls. The high demand for these animals has made the sale of animals at attractive prices relatively easy. Several producer organizations and auction facilities conduct public auctions. Shows and have increased public awareness and perception of the industry.

There has yet to be a 'typical' method of promoting trophy bulls developed in Saskatchewan due to the recent nature of the regulatory changes allowing trophy ranching. Many trophy ranch operators purchase bulls from breeders six to eight months prior to the season, while others choose to raise their own. Consignment sales and contract breeding have also occurred. Keeping good records for sires, grandsires and all offspring greatly improves the marketablity of breeding stock and young trophy bulls

Velvet antler buyers generally negotiate with individual producers. Recently, there has been a trend towards farms co-ordinating their marketing activities by combining their velvet antler production to create larger lots. These larger lots often result in higher prices for the producer; however, identity preservation could be lost if careful record-keeping is not maintained.

The provincial producer organization called the Saskatchewan Elk Breeders Association (SEBA) promotes the industry and increases contact between producers. The complete address of this organization can be found in Appendix VII.

Purchasers

Producers have to establish contacts with individuals who are interested in purchasing breeding stock, velvet and trophy bulls. Belonging to associations, attending exhibitions and trade shows and advertising in farm papers are some of the ways to make purchasers aware of the products that are for sale.

The velvet antler market is a complex market that requires considerable producer effort to obtain the highest price possible. Traditionally, the market has been dominated by a small number of large Korean pharmaceutical companies. As a result, the market has been characterized by a small number of velvet antler buyers and producers have essentially become "price-takers". The velvet antler buyer travels to the farms and negotiates the purchase of velvet antler with individual producers. As additional markets develop (i.e. China and North America), it is expected that this will result in a more market-driven pricing structure.

Recently, there has been a trend towards processing the velvet antler in Canada for sale either abroad or at home. Addresses of velvet antler processors in Canada are included in Appendix II.

Elk Production Information

The following section provides an overview of elk management. More specific and detailed information can be obtained from the provincial elk association, provincial officials listed in Appendix VII and existing producers. Anyone interested in establishing an elk enterprise should visit many existing operations to gain an appreciation for the industry and to learn first hand how to manage an elk operation.

Elk are native to Saskatchewan and as a result are well-adapted to life in our environment. Their metabolism slows down during the winter months, thereby requiring less feed. As a result, elk have lower winter feed requirements than cattle.

Pasture requirements for elk will vary depending on the type of pasture; however, as a general rule of thumb, one adult elk will require three acres of pasture. Elk producers, who are familiar with both cattle and elk, may use a general rule that three to five elk cows can be supported on the same amount of pasture that one beef cow would require.

Elk will generally be pastured during the summer and then have their diets supplemented with forage and grain during the winter months.

Elk are very hardy and require little or no calving assistance. They are, however, susceptible to a number of diseases and parasites. Producers should become familiar with these diseases so that they can identify and deal with any potential problems as soon as possible. Parasite control is another important aspect of herd management, and animals are normally treated for parasites two or three times per year. Attentive management is necessary to ensure that health problems are minimized.

The rut (breeding season) starts in September and lasts until mid-November. One bull will be required for every 20 to 30 cows. Table 5 outlines suggested breeding ratios. Be extremely cautious when handling elk during the breeding season, as the bulls become unpredictable and can be extremely dangerous at this time of the year.

Table 5: Single Sire Elk Bull to Cow Ratios.

Bull Age	Bull:Cow Ratio
15-18 months	1:5, max. 1:10
27 months	1 : 15
3 years	1 : 20
4 years	1 : 30
5 years & older	1 : 40-60

(Source: Adapted form Haigh & Hudson, 1993)

The animals should be in good condition before the start of breeding season to ensure high conception rates and adequate birth weights. Some studies have shown that the birth weight of the calf is directly linked to the weight and condition of the cow at time of breeding. Heifers are normally bred for the first time as yearlings (15 months), provided that they reach a minimum weight of 440lb. (200kg.), and then annually thereafter. The productive life of an elk cow may be as long as 20 years.

The gestation period of elk is 247 ±7 days. Calves are weaned either before or after breeding season. Recent studies indicate that one advantage to weaning before breeding season may be earlier calving dates.

Typical weights for elk are outlined in the following table.

Table 6: Typical Weights for Elk.

	Weight Range	
	Lb.	Kg.
Birth Wt.	35 - 62	16 - 28
Weaning Wt.	210 - 265	95 - 120
Mature Cows	500 - 700	230 - 320
Mature Bulls	790 - 1,100	360 - 500

(Source: Industry estimates, 1999)

The Canadian Food Inspection Agency (CFIA) requires that any stock sold be from a herd that is certified free of tuberculosis and brucellosis. This involves compulsory tuberculosis testing every three years for all captive elk in the herd that are two years of age and older. CFIA requires producers to obtain an Transportation Authorization Permit when transporting elk. These permits can be obtained from local district CFIA veterinarians. The regulations that govern the import or export of elk between provinces or countries can be complex; therefore, producers should obtain further advice from industry officials (Appendix VII).

Resource Requirements

The resources required for an elk enterprise include capital assets, such as land, handling facilities and fences, equipment and breeding stock, operating funds, labour and management. The estimates of specific resources required provided in this publication were obtained from industry experts.
These estimates must be adjusted to reflect individual circumstances.

Capital Asset Requirements

Capital assets required for an elk enterprise include land, handling facilities and fences, equipment and initial breeding stock.

Land

The amount of pastureland required will depend on the productive capacity of the land. (If hay is not being purchased then additional land is required for hay production.) Elk will use pasture more efficiently than cattle.

Most pastures should be subdivided and the elk rotated to maximize pasture usage. The pasture should be seeded with alfalfa or a combination of alfalfa and a perennial grass. Elk do not have the tendency to bloat as cattle do and can be grazed on pure alfalfa stands with little or no trouble. Information and testing of forage rations for venison and velvet antler production is very limited at this time. As this industry develops more information on rations will be available.

Further detailed information about pastures and forages for elk can be obtained from the Grazing & Pasture Technology Program (GAPT) publication entitled "*Pasture and Forages for Wapiti*". Appendix V also discusses pastures and forages for elk.

Producers may find that feeding hay as a supplement to the pasture is less costly than constructing additional fencing. As the elk enterprise grows in size, additional pasture will be required.

Fences

The Domestic Game Farm Animal Regulations require that fences used to confine game farm animals must be at least 2.1 metres (6 feet 10 inches) high and securely locked or latched to prevent both public access to the enclosure and the escape of game animals from the enclosure. Fencing for pastures is generally constructed of game fencing wire mesh that meet the fence height enough to meet the requirements. Typically, 12-foot posts are used for corners and brace-posts while 10-foot posts are used as line-posts. Fences will cost approximately $10,400 per mile.

Additional information specific to the construction of high-tensile game fences for elk can be found in the SAF FarmFact publication entitled "*Fencing for Elk and Deer*" (SUSDF0399). This publication is available at the SAF website or a printed copy can be ordered.

Handling Facilities

The type and size of handling facilities required depends on the size of the elk operation. Handling facilities can range from very basic to very elaborate. Regardless of what type of facilities is used, it is imperative that the safety of the animals be of primary concern when the facilities are being designed. The less stress that the animals experience during handling, the healthier and more productive they will be.

A typical handling facility includes:

- holding pen(s),
- sorting area,
- elk squeeze, and
- weigh scale.

Many producers house at least part of their handling facility in a shed. Darkness calms the elk, plus it eliminates the problem of working in inclement weather. Many producers incorporate a hydraulic squeeze in their operations, which allows them to handle the animals for velvetting and vaccination with a minimum of stress on both the handler and the animal. The corrals and handling system are used for loading and unloading elk, sorting, testing, vaccinating and/or quarantining, velvetting, tagging and weighing the elk.

Elk handling facility designs are constantly being refined and it is recommended that potential producers tour a number of existing operations in order to determine what type of facility will best fit their particular situation. The requirements of an expanding herd should also be considered when designing a handling facility. One example design of an elk handling system is provided in Appendix III.

Elk require an adequate supply of good-quality water. Water bowls, trenching and other water supply items will cost from $1,500 to $5,000. Whenever a new water source is being designed contact your nearest Prairie Farm Rehabilitation Administration (PFRA) office for assistance (Appendix VII). Always locate buried infrastructure before excavation begins.

Equipment

Equipment requirements vary with each elk operation. Basic requirements would include a pickup truck, tractor and loader for feeding and maintenance chores. If the operation involves velvetting bulls, then a freezer is required for storing the green velvet antler. The transportation of the elk can be done on a custom basis during the initial stage of production in order to minimize costs. A stock trailer may be purchased in a later year. If hay was to be

put up on the producer's own land then haying equipment would also be required. Fencing equipment can be rented until purchased later.

Breeding Stock

The initial breeding stock may consist of calves or open or exposed animals. A combination of heifers and cows provides the most economical means of developing a herd. Exposed heifers can also be purchased as breeding stock; however, initial purchase prices are higher. (Refer to the later section on cash flow projections.)

Table 7 summarizes the capital inputs required for an elk enterprise.

Operating Requirements

Cash costs include wages and benefits, feed, veterinary fees and supplies, repairs and maintenance, fuel and oil, utilities, insurance, marketing and transportation, property taxes, miscellaneous business costs and interest on cash costs.

Wages and Benefits

The amount of labour is approximately 66% of the requirement for a beef cow-calf enterprise since elk are handled less often and are seldom assisted during calving. Estimated wages (including the owner's wage) are $50 per head for mature breeding stock, replacements and bulls. For hired labour, benefits should be estimated at an additional 14% of the cost of wages and would include Canada Pension plan and unemployment insurance contributions.

Feed

Feed is the largest operating cost of an elk operation. Breeding stock requires approximately two percent of their body weight on a dry matter basis per day to maintain their weight. Appendix IV shows some feed testing results.

1) Hay requirements

Depending on the type and condition of pasture available, hay is usually only provided during the winter months.

Based on full winter feed, elk requirements are as follows:

Table 8: Estimated Yearly Hay Requirements.

	Lb./day	Days	Lb.	Tonnes
Cows	10	180	1,800	0.82
Bulls	12	180	2,160	0.98

Table 7: Summary of the Capital Inputs of an Elk Enterprise.

Capital Inputs	Cost
Land	$100 - $400/acre
Pasture Improvement	$ 30/acre
Fence	$ 10,400/mile
Handling Facility	$ 5,000 - $ 25,000
Hydraulic Squeeze	$ 5,000 - $ 10,000
Water trenching and other equipment	$ 1,500 - $ 5,000
2 ton truck	$ 10,000 (used) - $ 30,000 (new)
Stock Trailer	$ 5,000 - $ 10,000
Tractor with loader	$ 8,000 - $ 15,000
Freezer	$ 700 (chest) - $ 10,000 (walk-in) each
Breeding Stock	market price (see Table 14)
Miscellaneous	vary with the size of operation

Feed costs for replacements are estimated to be 75% of those for adults.

If forage is available and snow is not too deep, elk will use pasture to some extent during the winter, however, common practice is to feed the herd for the entire winter period.

2) Grain requirements

Grain is usually used to supplement the hay and to flush elk cows during breeding time to ensure a high conception rate. Oats are the most common choice, with some producers also using barley.

Table 9: Estimated Yearly Grain Requirements.

	Lb. /day	Days	Lb.	Tonnes
Cows	4	180	720	0.33
Bulls	6	150	900	0.41

3) Supplement requirements

Elk will not often willingly consume mineral supplements. Therefore, a pelleted supplement that contains protein, minerals and salt is recommended to be fed year round.

Table 10: Estimated Yearly Supplement Requirements.

	Lb. /day	Days	Lb.	Tonnes
Yearling	0.55	365	201	0.09
Cows	1.10	365	402	0.18
Bulls	1.10	365	402	0.18

Livestock Purchases

Velvet bulls or feeder animals could be purchased to create, or expand, a velvet antler or feeder enterprise.

Breeding Stock Purchases

Additions and/or replacements to the breeding herd are often retained from the herd's annual calf crop. New bulls will be needed as the heifers reach breeding age in order to avoid inbreeding which would have a detrimental effect on the long-term genetics of the herd. Improved genetics can be introduced into the herd quicker with a bull, since 50% of genetics in the offspring come from each gender. Leasing a breeding bull and artificial insemination are other ways of introducing new genetics into a herd.

Veterinary Fees and Supplies

Veterinary services include: deworming medication, blood tests, minor treatments with antibiotics, vaccinations, faecal sample testing and velvetting supplies.

Repairs and Maintenance

Repairs and maintenance is required for vehicles, fences, handling facilities, etc.

Fuel and Oil

Fuel and oil is required for the truck and tractor. Currently fuel prices are becoming one the more inflationary expense items.

Utilities

Telephone is used to make marketing arrangements and source stock. Hydro costs will be minimal.

Insurance

Insurance on elk cows costs approximately $7 - $10 per $100 value. In the accompanying analysis, insurance is carried the first year, after which the farmer is self-insured. It is important to remember that all perils insurance is more expensive that policies that cover accidental deaths. Insurance to cover government ordered destruction is often above any standard policies offered.

Marketing and Transportation

Marketing and transportation costs will depend on the marketing system used. A large part of these costs may be the cost of advertising the stock for sale, as most of the sales will be made FOB (freight on board) the farm. The cost is estimated to be $10 per head marketed.

Death Loss

When properly managed, elk should be productive for many years. However, a death loss of three percent is factored into the expenses. This amount is calculated as three percent of the value of the total herd and is used to replace any animals that may die.

Property Taxes

Property taxes are paid on a per acre basis.

Miscellaneous Costs

Miscellaneous costs are items such as license fees, advertising, association memberships, etc.

Operating Interest

Interest on cash costs should be calculated on the average amount of costs for the year.

Table 11 summarizes the operating inputs required for an elk enterprise.

Table 12 and 13 provide an example of the capital investment and operating costs of an established 60 cow/ 50 velvet bull elk enterprise.

Table 11: Summary of the operating inputs of an elk enterprise.

Operating Inputs	Costs
Labour	$50/head
Feed - Hay (180 days/year - forage valued at $60 per tonne) - Grain (oats) (180 days/year - oats valued at $100 per tonne) - Supplement (365 days/year - supplement at $300 per tonne) Total Feed Cost - Per Cow - Per Bull - Yearling	0.82 tonne/cow ($49/ cow); 0.98 tonne/bull ($59/bull); 0.68 tonne/yearling ($41/yearling) 0.33 tonne/cow ($33/cow); 0.41 tonne/bull ($41/bull); 0.28 tonne/yearling ($28/yearling) 0.18 tonne/cow or bull ($54 per cow or bull); 0.09 tonne/yearling ($27/yearling) $ 136 per head $ 154 per head $ 96 per head
Livestock/ breeding stock purchases	market price (see Table 14)
Veterinary Fees and Supplies	$ 30/cow; $ 25/yearling or bull
Repairs and Maintenance	vary with the size of the operation
Gas, Fuel & Oil	$ 15/head
Utilities	$ 15/bull; $10/head for cows and yearlings
Insurance	$ 7- $ 10 per $ 100 value of breeding herd
Marketing & Transportation	$ 10/head
Death Loss	5% for calves; 3% for all others
Game Farm License	$ 200/ 5 years, renewable $ 150/ 5 years
Property Taxes	$ 1.00 - $ 5.00/acre
Miscellaneous	vary with the size of operation

Table 12: Capital Investment for an Established 60 cow/50 velvet bull Elk Enterprise.

Breeding and Velvet Livestock	# of Head	Cost per Head	Total Cost
Elk Cows	57	$ 6,000	$ 341,128
Exposed Heifers	3	$ 7,600	$ 22,555
Breeding Bulls	5	$ 7,000	$ 35,000
Velvet Bulls	70	$ 1,000	$ 125,147
		Total	**$ 523,830**

Land	Acres	Cost/Acre	Total Cost
Pasture	160	$ 150	$ 24,000
Pasture Development	160	$ 30	$ 4,800
		Total	**$ 28,800**

Facilities, Fence and Equipment	Miles	$/Mile	Total Cost
Fence	3.6	$ 10,400	$ 37,440
Handling System & Hydraulic Squeeze			$ 20,000
Truck (1/2 ton), Stock Trailer, Tractor & Loader (used); 3 freezers			$ 28,000
Miscellaneous			$ 2,000
		Total	**$ 87,440**
		Total Capital Investment	**$ 640,070**

Table 13: Summary of Cash Costs for an Established 60 Cow/50 velvet bull Elk Enterprise.

Operating Inputs	Cow-Calf Costs	Velvet Bull Costs	Total Costs
Wages and Benefits	$ 3,410	$ 4,248	$ 7,658
Grain	$ 1,723	$ 2,683	$ 4,406
Hay	$ 2,943	$ 4,382	$ 7,325
Supplement	$ 3,230	$ 4,024	$ 7,255
Livestock Purchases	$ 0	$ 0	$ 0
Breeding Stock Purchases	$ 0	$ 0	$ 0
Veterinary Fees and Supplies	$ 1,496	$ 1,963	$ 3,359
Repairs and Maintenance	$ 897	$ 1,118	$ 2,015
Fuel and Oil	$ 897	$ 1,118	$ 2,015
Utilities	$ 598	$ 1,118	$ 1,716
Insurance	$ 0	$ 0	$ 0
Marketing and Transport	$ 598	$ 745	$ 1,343
Death Loss	$ 10,910	$ 3,621	$ 14,532
Miscellaneous	$ 350	$ 350	$ 700
Operating Interest	$ 1,099	$ 1,648	$ 2,747
Total Cash Costs	**$ 31,144**	**$ 27,292**	**$ 48,337**

Cash cost of raising a calf to weaning = $ 31,144 / 48 calves = $648.83/calf.

Cash cost of maintaining a velvet bull = $ 27,292 / 50 bulls =$545.84/bull.

Income

At the present time, the main source of revenue is the sale of breeding stock. Other revenue comes from the sale of velvet antler, trophy bulls and venison

Table 14: Estimated Elk Price List (Saskatchewan), January 2000.

	Price
Bull Calves* - velvet	$ 1,000
- breeder potential	$ 3,000 - $ 5,000
Heifer Calves*	$ 3,900
Exposed Heifers	$ 7,600
Yearling Velvet Bulls	$ 1,800
Exposed Cows	$ 6,000
Trophy Bulls	$ 2,500 - $ 6,000+
Breeding Bulls	$ 7,000

* Spring calves sold late in the fall.
+ Prices of trophy bulls vary greatly with their antler score.
Source: Weighted averages of public auction results.

Projected Income Statement

The projected income statement is based on the following assumptions:

1) The breeding herd consists of 54-57 cows and 3-6 exposed replacement heifers, for a total of 60 females to calve each year. Calving rate is 95% for cows and 85% for heifers, with a 95% weaning rate for both. Equal numbers of heifer and bull calves are born.

2) The velvet herd consists of 50 bulls, five of which are used as the breeding bulls.

3) 100% of the heifer calves are retained, with 50% of them being sold as exposed heifers the year following until the herd reaches 60 cows. The balance are retained to maintain and build the breeding herd or sold as exposed heifers after the herd reaches 60 cows. Cull cows will also be sold for slaughter.

4) 100% of the bull calves are retained as velvet bulls. In Years 5 to 10, a portion of the bulls aged three years and older are being sold as trophy bulls. This retention scenario may change over time as the prices of trophy bulls and velvet antler prices change.

Income and Cost Summary

Tables 15 and 16 provide a summary of the income and cost for a 60 cow/50 velvet bull elk enterprise. The depreciation figure is an average of the depreciation shown on the financial statement provided in Appendix I.

Table 15: Projected Annual Income for an Established 60 Cow/50 Velvet Bull Elk Enterprise.

Description	No. of animals	Value/Head	Total Value
Heifer Calves	5	$ 3,900	$ 20,769
Exposed Heifers	17	$ 7,600	$ 129,200
Herd Cows	0	$ 6,000	$ 0
Cull Cows	3	$ 1,000	$ 2,777
Bull Calves	0	$ 1,640	$ 0
Velvet Bulls	0	$ 1,800	$ 0
Slaughter Bulls	1	$ 1,500	$ 1,177
Breeding Bulls	0	$ 7,000	$ 0
Hunt Bulls	10	$ 3,000	$ 30,000
Velvet antler	538 lbs.	$ 70/lb.	$ 37,688
Total	**36**		**$ 221,611**

Table 16: Estimated Income and Cost Summary of an Established 60 Cow/50 Velvet Bull Elk Enterprise.

	Total Amount
Total Cash Income	$ 221,611
Less: Total Cash costs	$ 78,102
Equal: Net Cash Income	$ 143,509
Plus: Inventory Change	$ 33,700
Less: Depreciation (Facilities & Equipment)	$ 3,891
Equals: Return to Investment and Management	**$ 173,317**

Cash Flow Projections

Most producers start an elk enterprise by purchasing exposed heifers and a breeding bull. This approach reduces the amount of capital needed and provides an opportunity for the producer to become familiar with raising elk while the enterprise is small. However, cash flow requirements must be estimated and carefully managed. Appendix I provides a set of financial statements based on the purchase of 15 heifer calves, 17 exposed heifers and one breeding bull as a breeding herd. The accumulated cash flow deficit reaches $23,369 in Year 4, before starting to decrease in Year 5. The level of management, the rate of expansion and the purchase of breeding stock will effect the rate of growth of the herd and the cash flow requirements.

Cash flow management will be important for an elk enterprise after it is fully developed. While expenses will occur throughout the year, the majority of the cash inflow will occur during short periods each year when stock and velvet antler are sold.

Projected Financial Statements

A complete set of financial statements is provided in Appendix I and presents an example of the expected financial results of an elk enterprise that is initially established with 15 heifer calves, 17 exposed heifers and one mature breeding bull.

The purpose of this financial model is to provide information to potential producers who may be interested in establishing an elk enterprise. This model identifies the resources needed and includes a financial analysis that demonstrates an approach to determine the cash flow requirements and the profitability of establishing an elk farm.

The reader is cautioned that some of the assumptions used in these financial statements - although considered reasonable -will change as the industry continues to develop, especially in the area of future product prices. Changes in product prices will have a major impact on profitability. The prices used are representative of market conditions at the time of publication, and are not meant to predict future prices. A product price sensitivity analysis has been included in the financial statements in Appendix I. See Figures 5, 6 and 7 for the effects of changes in product prices on accumulated cash flow, equity and annual net income. Many of the assumptions are based on current information and are provided by existing producers.

The following assumptions were used when creating these financial statements:

1) It is assumed that the decision to develop an elk enterprise is made in Year 1 of these fiscal projections. The initial capital investment is $295,490. The amount of equity is $125,000, with the balance being borrowed and repaid over a 10-year period at 8% interest. Initial handling facilities and fences will be developed and constructed during Year 1, with expansion occurring as required during future years. Seventeen bred heifers, 15 heifer calves and a breeding bull will be purchased in November of Year 1 and will produce a calf crop in Year 2. The heifer calves will be bred at 16 months of age and produce their first calves at 24 months of age. This is consistent with the goals of this enterprise, which is to expand to a herd size of 60 cows and 50 velvet bulls. Once the projected herd size of 60 cows is reached, females will be sold in order to maintain consistent herd numbers. An allowance of 3% of the total value of the herd is provided in the estimate of expenses to replace animals that die.

2) The investment cost of equipment purchased for the elk enterprise is based on the assumption that used equipment would be purchased when available. While this assumption reduces the investment costs, the amount allowed for maintenance is higher.

3) One hundred and sixty acres of pastureland was purchased for this enterprise and 80 acres were improved in Year 1 and a further 80 acres improved in Year 4. It is assumed that this land will provide the summer grazing requirement for this established elk enterprise. Initially, only a portion of the land will be required to support the elk herd, and the remainder may be used in another enterprise. The land will be brought into production as warranted by the elk herd expansion. No attempt is made in this analysis to include any revenue from an alternate use of the extra land.

4) In addition to the initial capital investment, operating loans reach a total of $23,369 in the fourth year of operation. An interest charge of 8% on the outstanding balance of the operating loan is included as a cash expense.

5) The cost of purchasing stock is based on information derived by calculating the weighted averages of public auction results (Table 14).

6) The cow-to-bull ratio will be maintained at no greater than 25:1.

7) A calving rate of 95% for cows and 85% for heifers with a weaning rate of 95% for both cows and heifers are assumed in this budget. Equal number of heifer and bull calves are born.

8) Forty acres of the quarter section are fenced in Year 1, with additional pastures of 40 acres being fenced in each of Years 6, 7 and 8.

9) A used half-ton pick-up truck is purchased in Year 1 for $10,000. Large chest freezers are purchased in Year 2, 5 and 7 for $700 each. A stock trailer is purchased in Year 3 for $5,000. A used tractor and loader is purchased in Year 4 for $9,000.

10) Elk are fed hay and grain during the winter and receive supplement year round.

11) Handling facilities are constructed in Year 1. They are constructed in a manner that will allow for expansion as the herd size increases.

12) Market value of stock remains constant through the 10 years of this example.

13) All sales and purchases of stock occur in the fourth quarter of the year, after velvetting and breeding. All velvet antler is sold in the year of production.

14) Slaughter bulls will be assumed to be at least three years of age. Trophy bulls will come from the velvet herd, and be bulls of at least three years of age. Bulls sold as trophies cannot have the velvet harvested in the year they are sold.

15) Breeding bulls will be purchased and sold as necessary to insure proper genetic progress.

Table 17 is a summary of the projected cash flow and income statement for the elk enterprise provided in Appendix I.

Table 17: Projected Cash Flow and Income.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Cash Flow from Production	($2,648)	($2,368)	($4,334)	($14,019)	$11,301	$16,930	$30,823	$37,890	$111,627	$112,320
Accumulated Cash	($2,648)	($5,016)	($9,350)	($23,369)	($12,068)	$4,862	$35,685	$73,575	$185,202	$297,522
Net Income	($7,786)	$26,247	$30,274	$62,612	$71,393	$93,318	$114,323	$136,584	$161,734	$173,317

Table 18 identifies the present value (PV) of the net income. In analysing a proposed enterprise, it is important to note that the present value of future income is a significant measurement. If a proposed enterprise has a present value of net income that is less than the equity investment, it should be rejected. A present value of net income that is greater than the equity invested would reflect a net increase in equity over the term of the analysis.

Table 18: Present Value of Net Income.

PV of Net Income	$ 603,976
Less Initial Investment	$ 125,00
Net Present Value of Income	$ 478,976

Table 19 shows the owner's equity and the compound average rate of return on the initial investment in the enterprise for the first 10 years.

Sensitivity Analysis - Market Price Assumptions

A sensitivity analysis is included in the example provided in Appendix I. While production technology and the cost of inputs will vary from year to year, the overall impact of these items on the profitability of an elk enterprise will be small. The variability in the market value of the animals will have the largest impact on the profitability of an elk breeding stock enterprise. Therefore, the sensitivity analysis evaluates the impact of changes in market values on the cash flow statement, net income statement and balance sheet.

Figures 5, 6 and 7 demonstrate the effects declining market values have on cash flow, equity and net income of an elk enterprise.

Table 19: Owner's Equity and Return on Initial Investment.

Intial Equity Investment		**$125,000**	**Avg. Compound Growth Rate**
Owner's Equity-end of:	Year 1	$ 117,214	-6%
	Year 2	$ 143,461	7%
	Year 3	$ 173,735	12%
	Year 4	$ 236,346	17%
	Year 5	$ 307,739	20%
	Year 6	$ 401,057	21%
	Year 7	$ 515,379	22%
	Year 8	$ 651,963	23%
	Year 9	$ 813,698	23%
	Year 10	$ 987,015	23%
Change in Owner Equity		$ 862,015	
Average Compound Rate of Growth		16.24%	

Figure 5: Accumulated Cash Flow (Sensitivity Analysis).

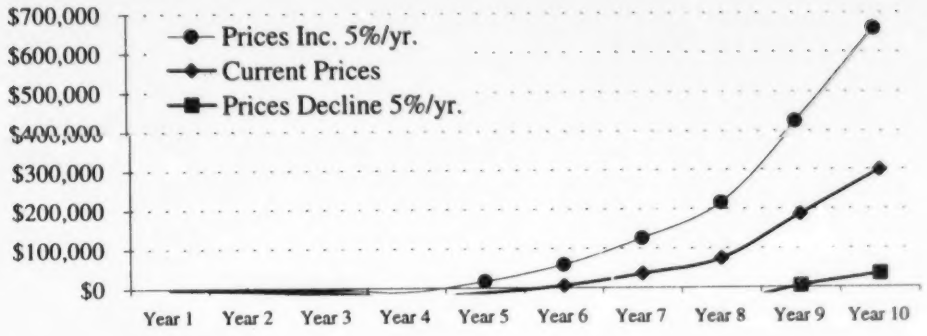


Figure 6: Enterprise Equity (Sensitivity Analysis).

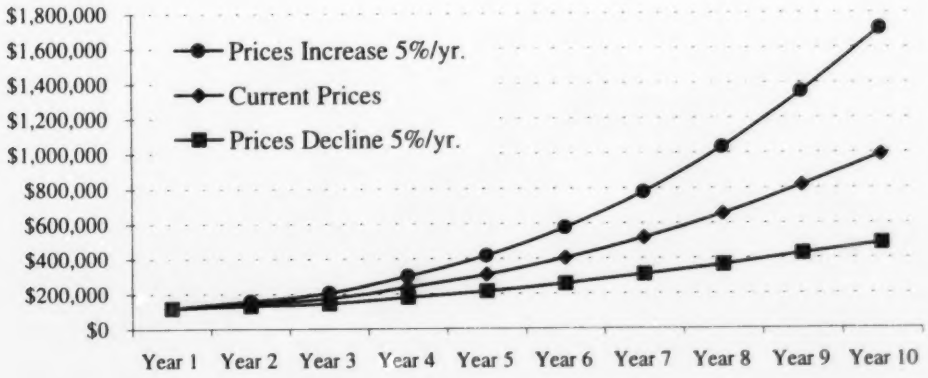
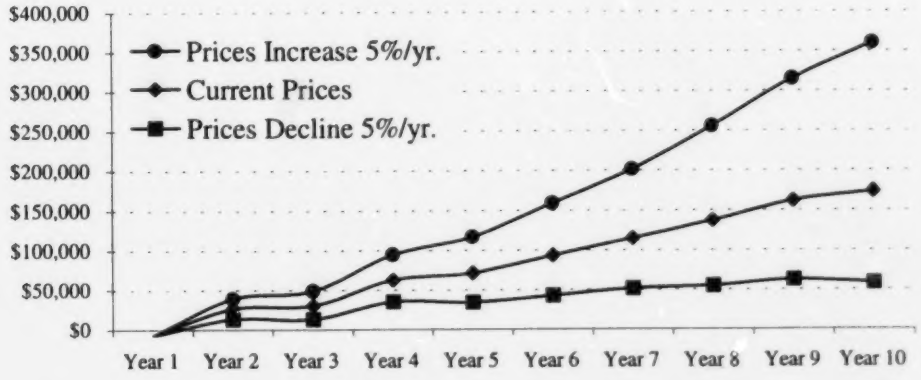


Figure 7: Annual Net Income for an Elk Enterprise (Sensitivity Analysis).



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Appendix I: Projected Financial Statements

Economics of Elk Production in Saskatchewan

PRODUCER INFORMATION:

Startup Profile

Number of Heifer Calves:	15
Number of Exposed Heifers:	17
Number of Herd Cows:	0
Number of Bull Calves:	0
Number of Yearling Bulls:	0
Number of 2+ Year Old Bulls:	0
Number of Breeding Bulls:	1

Pasture Available (acres):	160
Cash Equity Available:	$125,000
Amount of Capital Borrowed:	$170,490
Interest Rate:	8.00%
Term of Loan:	10

GENERAL

The purpose of this financial model is to assist potential producers who may be interested in establishing an Elk enterprise. This model identifies the resources to be utilized and also includes a financial analysis to determine the profitability of establishing an Elk production operation in Saskatchewan.

The Financial Statement, Income Statement, and Cash Flow projections presented are standardized in the information presented to meet the needs of the producer as well as any financial institution to determine the viability of the operation.

CAUTION

The reader is cautioned that some of the assumptions used in preparation of these financial projections, although considered reasonable, will inevitably prove to be incorrect. The assumptions are, for the most part, based on information that is presently available from producers. As this industry develops the quality of production, financial and market information will improve.

The reader is further cautioned that the actual results achieved during the forecast period will vary from the forecasted results. It is reader's reponsibility to change this example to reflect production levels, costs and expected market prices based on personal expectations. This example should be used only as a guide and not for business analysis without modification to reflect individual management levels.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Accumulated Cash Flow End of Year	($2,648)	($5,016)	($9,350)	($23,369)	($12,068)	$4,862	$35,685	$73,575	$185,202	$297,522
Equity at The End of Year:	$117,214	$143,461	$173,735	$236,346	$307,739	$401,057	$515,379	$651,963	$813,698	$987,015
Average Compound Rate of Return On Initial Equity Investment To The End of Yr	-6%	7%	12%	17%	20%	21%	22%	23%	23%	23%

Appendix I: Projected Financial Statements

Economics of Elk Production in Saskatchewan

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Average Compound Rate of Return On Initial Equity Investment To The End of Yr	-6%	7%	12%	17%	20%	21%	22%	23%	23%	23%

Cash Flow Statement Summary

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Cash Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Total Variable Costs	$196,948	$15,280	$18,353	$30,607	$31,095	$43,917	$43,090	$57,609	$59,193	$71,430
Total Fixed Costs	$400	$26,020	$26,209	$27,301	$31,016	$30,112	$30,488	$31,829	$32,723	$37,862
Total Cash Costs	$197,348	$41,299	$44,563	$58,108	$62,111	$74,028	$73,577	$89,438	$91,916	$109,291
Net Cash Income	($197,348)	($1,668)	($4,334)	($14,019)	$12,001	$16,930	$31,523	$37,890	$111,627	$112,320
Total Capital Inflow	$295,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Total Capital Outflow	$100,790	$700	$5,000	$17,400	$700	$9,000	$9,700	$6,000	$0	$0
Net Cash Flow From Production	($2,648)	($2,368)	($4,334)	($14,019)	$11,301	$16,930	$30,823	$37,890	$111,627	$112,320
Accumulated Cash Flow	($2,648)	($5,016)	($9,350)	($23,369)	($12,068)	$4,862	$35,685	$73,575	$185,202	$297,522

Cash Flow Sensitivity Analysis

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Projected Cash Flow Based On Market Values That Are 80 Per Cent Of The Projected Market Values										
Net Cash Flow From Production	($2,648)	($10,294)	($12,380)	($22,837)	($3,521)	($1,262)	$9,803	$12,425	$70,918	$90,159
Accumulated Cash Flow	($2,648)	($12,942)	($25,322)	($48,159)	($51,680)	($52,942)	($43,139)	($30,714)	$40,204	$130,362
Projected Cash Flow Based On Market Values That Are 110 Per Cent Of The Projected Market Values										
Net Cash Flow From Production	($2,648)	$1,595	($312)	($9,610)	$18,712	$26,026	$41,333	$50,623	$131,981	$134,481
Accumulated Cash Flow	($2,648)	($1,052)	($1,364)	($10,974)	$7,738	$33,764	$75,097	$125,720	$257,701	$392,182
Projected Cash Flow Based On Market Values That Decrease by 5 Per Cent Per Year										
Net Cash Flow From Production	($2,648)	($4,350)	($8,257)	($20,307)	($2,446)	($3,646)	$2,981	($520)	$43,118	$30,379
Accumulated Cash Flow	($2,648)	($6,997)	($15,254)	($35,561)	($38,007)	($41,654)	($38,673)	($39,193)	$3,926	$34,305
Projected Cash Flow Based On Market Values That Decrease by 10 Per Cent Per Year										
Net Cash Flow From Production	($2,648)	($6,331)	($11,978)	($25,967)	($14,186)	($20,318)	($18,423)	($28,537)	($4,298)	($23,435)
Accumulated Cash Flow	($2,648)	($8,979)	($20,957)	($46,924)	($61,110)	($81,428)	($99,851)	($128,388)	($132,686)	($156,120)
Projected Cash Flow Based On Market Values That Increase by 5 Per Cent Per Year										
Net Cash Flow From Production	($2,648)	($386)	($211)	($7,069)	$27,273	$42,060	$66,567	$89,725	$208,809	$234,500
Accumulated Cash Flow	($2,648)	($3,034)	($3,245)	($10,314)	$16,958	$59,019	$125,586	$215,311	$424,120	$658,620

Net Income Summary

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Cash Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Minus Variable Costs	$196,948	$15,280	$18,353	$30,807	$31,095	$43,917	$43,090	$57,609	$59,193	$71,430
Minus Fixed Costs	$400	$26,020	$26,209	$27,301	$31,016	$30,112	$30,488	$31,829	$32,723	$37,862
Net Cash Income	($197,348)	($1,668)	($4,334)	($14,019)	$12,001	$16,930	$31,523	$37,890	$111,627	$112,320
Accrual Adjustments:Accrual Adjustments:										
Inventory Adjustment	$194,700	$25,357	$29,575	$70,333	$50,562	$65,064	$68,787	$81,954	$30,544	$33,700
Plus Principal Paid	$0	$11,769	$12,710	$14,072	$16,399	$17,711	$19,749	$21,951	$24,121	$31,189
Minus Depreciation	$5,139	$9,211	$7,677	$7,774	$7,570	$6,387	$5,737	$5,211	$4,557	$3,891
Net Income From Business	($7,786)	$26,247	$30,274	$62,612	$71,393	$93,318	$114,323	$136,584	$161,734	$173,317

Present Value of Net Income Analysis

Present Value Of Net Income	$603,976
Minus Initial Investment	$125,000
Present Value Of Income	
Less Initial Equity	$478,976

Net Income Sensitivity Analysis

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Projected Net Income Based On Market Values That Are 80 Per Cent Of The Projected Market Values										
Net Income From Business	($7,786)	($25,691)	$16,313	$39,727	$46,458	$62,113	$79,545	$94,727	$114,917	$122,255
Projected Net Income Based On Market Values That Are 110 Per Cent Of The Projected Market Values										
Net Income From Business	($7,786)	$52,216	$37,254	$74,054	$83,860	$108,920	$131,712	$157,512	$185,143	$198,848
Projected Net Income Based On Market Values That Decrease By 5 Per Cent Per Year										
Net Income From Business	($7,786)	$13,262	$13,015	$35,028	$34,550	$42,933	$51,406	$54,913	$62,473	$58,453
Projected Net Income Based On Market Values That Decrease By 10 Per Cent Per Year										
Net Income From Business	($7,786)	$278	($2,794)	$11,383	$5,192	$5,115	$7,125	$596	$370	($9,635)
Projected Net Income Based On Market Values That Increase By 5 Per Cent Per Year										
Net Income From Business	($7,786)	$39,231	$48,982	$94,408	$116,781	$158,943	$201,258	$255,578	$314,752	$359,647

Present Value of Net Income Sensitivity Analysis

Projected Net Income Based On Market Values That Are 80 % Of The Projected Market Values

Present Value Of Net Income	$368,586
Minus Initial Investment	125,000
Present Value Of Income Minus Initial Equity	$243,586

Projected Net Income Based On Market Values That Are 110 % Of The Projected Market Values

Present Value Of Net Income	$721,672
Minus Initial Investment	125,000
Present Value Of Income Minus Initial Equity	$596,672

Projected Net Income Based On Market Values That Are Decreasing By 5 Per Cent Per Year

Present Value Of Net Income	$253,638
Minus Initial Investment	125,000
Present Value Of Income Minus Initial Equity	$128,638

Projected Net Income Based On Market Values That Are Increasing By 5 Per Cent Per Year

Present Value Of Net Income	$1,097,957
Minus Initial Investment	125,000
Present Value Of Income Minus Initial Equity	$972,957

Projected Net Income Based On Market Values That Are Decreasing By 10 Per Cent Per Year

Present Value Of Net Income	$7,463
Minus Initial Investment	125,000
Present Value Of Income Minus Initial Equity	($117,537)

NOTE: Columns may not add due to rounding.
Present value of the income is calculated at a discount rate of 5%.

Balance Sheet Summary - Initial Equity Investment = **$125,000**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Equity - End Of Year	$117,214	$143,461	$173,735	$236,346	$307,739	$401,057	$515,379	$651,963	$813,698	$987,015
Average Compound Rate Of Return On Initial Equity Investment To The End Of This Year	-6%	7%	12%	17%	20%	21%	22%	23%	23%	23%

Balance Sheet Sensitivity Analysis

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Projected Balance Sheet Based On Market Values That Are 80 Per Cent Of The Projected Market Values										
Equity - End Of Year	$117,214	$91,523	$107,836	$147,563	$194,021	$256,134	$335,680	$430,407	$545,324	$667,579
Average Compound Rate Of Return On Investment To The End Of the Year	-6%	-14%	-5%	4%	9%	13%	15%	17%	18%	18%
Projected Balance Sheet Based On Market Values That Are 110 Per Cent Of The Projected Market Values										
Equity - End Of Year	$117,214	$169,429	$206,684	$280,738	$364,598	$473,518	$605,229	$762,741	$947,884	$1,146,732
Average Compound Rate Of Return On Investment To The End Of the Year	-6%	16%	18%	22%	24%	25%	25%	25%	25%	25%
Projected Balance Sheet Based On Market Values That Decrease By 5 Per Cent Per Year										
Equity - End Of Year	$117,214	$130,476	$143,492	$178,519	$213,069	$256,002	$307,408	$362,321	$424,793	$483,247
Average Compound Rate Of Return On Investment To The End Of the Year	-6%	2%	5%	9%	11%	13%	14%	14%	15%	14%
Projected Balance Sheet Based On Market Values That Decrease By 10 Per Cent Per Year										
Equity - End Of Year	$117,214	$117,492	$114,698	$126,081	$131,273	$136,387	$143,513	$144,109	$144,479	$134,843
Average Compound Rate Of Return On Investment To The End Of This Year	-6%	-3%	-3%	0%	1%	1%	2%	2%	2%	1%
Projected Balance Sheet Based On Market Values That Increase By 5 Per Cent Per Year										
Equity - End Of Year	$117,214	$156,445	$205,427	$299,835	$416,616	$573,559	$776,817	$1,032,395	$1,347,147	$1,708,794
Average Compound Rate Of Return On Investment To The End Of the Year	-6%	12%	18%	24%	27%	29%	30%	30%	30%	30%

Note: Columns may not add due to rounding.

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Schedule 1A - Opening Asset Investment Schedule

A. Livestock	No. Of Head	Cost/Head	Total Cost
Heifer Calves	15	$3,900	$58,500
Exposed Heifers	17	$7,600	$129,200
Herd Cows	0	$6,000	$0
Bull Calves	0	$1,640	$0
Yearling Velvet Bulls	0	$1,800	$0
Two+ Year Old Bulls	0	$1,800	$0
Breeding Bulls	1	$7,000	$7,000
Total Livestock	33		$194,700
B. Land and Improvements	**Acres Req.**	**Cost/Acre**	**Total Cost**
Pasture	**160**	**$150**	$24,000
Pasture Development	**80**	**$30**	$2,400
Total Land and Improvements	160		$26,400
C. Facilities and Equipment	**Total Miles**	**Cost/Mile**	**Total Cost**
Fencing	**1.60**	**$10,400**	$16,640
Handling System			**$20,000**
Loader			**$15,000**
Tractor and Truck			**$17,750**
Miscellaneous			**$5,000**
Total Facilities and Equipment			$74,390
Total Initial Capital Requirements			$295,490

Schedule 1B - Livestock Market Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Heifer Calves	**$3,900**	3900	3900	3900	3900	3900	3900	3900	3900	3900
Exposed Heifers	**$7,600**	7600	7600	7600	7600	7600	7600	7600	7600	7600
Herd Cows	**$6,000**	6000	6000	6000	6000	6000	6000	6000	6000	6000
Slaughter Cows	**$1,000**	1000	1000	1000	1000	1000	1000	1000	1000	1000
Bull Calves	**$1,640**	1640	1640	1640	1640	1640	1640	1640	1640	1640
Velvet Bulls: yearlings	**$1,800**	1800	1800	1800	1800	1800	1800	1800	1800	1800
Velvet Bulls (2+ yrs old)	**$1,800**	1800	1800	1800	1800	1800	1800	1800	1800	1800
Slaughter Bulls	**$1,500**	1500	1500	1500	1500	1500	1500	1500	1500	1500
Breeding Bulls	**$7,000**	7000	7000	7000	7000	7000	7000	7000	7000	7000
Hunt Bulls	**$3,000**	3000	3000	3000	3000	3000	3000	3000	3000	3000
Velvet - Green (per lb)	**$70**	70	70	70	70	70	70	70	70	70

Schedule 1A - Opening Asset Investment Schedule

A. Livestock	No. Of Head	Cost/Head	Total Cost
Heifer Calves	15	$3,900	$58,500
Exposed Heifers	17	$7,600	$129,200
Herd Cows	0	$6,000	$0
Bull Calves	0	$1,640	$0
Yearling Velvet Bulls	0	$1,800	$0
Two+ Year Old Bulls	0	$1,800	$0
Breeding Bulls	1	$7,000	$7,000
Total Livestock	33		$194,700
B. Land and Improvements	**Acres Req.**	**Cost/Acre**	**Total Cost**
Pasture	160	$150	$24,000
Pasture Development	80	$30	$2,400
Total Land and Improvements	160		$26,400
C. Facilities and Equipment	**Total Miles**	**Cost/Mile**	**Total Cost**
Fencing	1.60	$10,400	$16,640
Handling System			$20,000
Loader			$15,000
Tractor and Truck			$17,750
Miscellaneous			$5,000
Total Facilities and Equipment			$74,390
Total Initial Capital Requirements			$295,490

Schedule 1B - Livestock Market Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Heifer Calves	$3,900	3900	3900	3900	3900	3900	3900	3900	3900	3900
Exposed Heifers	$7,600	7600	7600	7600	7600	7600	7600	7600	7600	7600
Herd Cows	$6,000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Slaughter Cows	$1,000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Bull Calves	$1,640	1640	1640	1640	1640	1640	1640	1640	1640	1640
Velvet Bulls: yearlings	$1,800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Velvet Bulls (2+ yrs old)	$1,800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Slaughter Bulls	$1,500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Breeding Bulls	$7,000	7000	7000	7000	7000	7000	7000	7000	7000	7000
Hunt Bulls	$3,000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Velvet - Green (per lb)	$70	70	70	70	70	70	70	70	70	70

Schedule 1C - Production Profile

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Calving Rate										
Cows	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Heifers	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Weaning Rate	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Cull Rate[1]										
Cows	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Heifers	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Breeding Bulls	Breeding bulls are replaced as required.									
Velvet Bulls	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Death Rate										
Cows & Heifers & Bulls	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Retention Rate[2]										
Heifers	100%	100%	100%	100%	100%	100%	100%	100%	80%	80%
Bull calves (for velvet herd & Hunt)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] cull rate refers to animals that are sold for slaughter, animals sold to other operations for breeding are entered as annual sales in schedule 2

[2] retention rate refers to the fraction of the calf crop that is retained to provide replacements for the breeding and velvet herds. Note that the high retention rates during the early years are needed to build the herd size.

Velvet Production per Bull	
4 Year Olds and Older	16.24
3 Year Olds	10.83
2 Year Olds	7.83
Yearlings	2.84

Schedule 2 - Inventory Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Inventory										
Heifer Calves	0	15	7	11	12	14	17	19	22	20
Exposed Heifers	0	17	10	2	6	6	7	9	9	6
Herd Cows	0	0	17	25	26	31	36	41	47	54
Bull Calves	0	0	7	11	12	14	17	19	22	25
Velvet Bulls (coming 2 years)	0	0	0	7	11	12	14	17	19	22
Velvet Bulls (coming 3 years)	0	0	0	0	7	11	12	14	17	19
Velvet Bulls (3+ years old)	0	0	0	0	0	1	3	7	12	16
Breeding Bulls	0	1	1	1	2	2	3	3	4	4
Total Value Opening Inventory	$0	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877
Annual Increase in Inventory										
Heifer Calves (weaned)	0	7	11	12	14	17	19	22	25	27
Heifer Calves(purchased)	15	0	0	0	0	0	0	0	0	0
Exposed Heifers (purchased)	17	0	0	0	0	0	0	0	0	0
Herd Cows (purchased)	0	0	0	0	0	0	0	0	0	0
Bull Calves (weaned)	0	7	11	12	14	17	19	22	25	27
Bull Calves (purchased)	0	0	0	0	0	0	0	0	0	0
Velvet bulls:yearlings (purch)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls:2+ years old (purch)	0	0	0	0	0	0	0	0	0	0
Breeding bulls (purchased)	1	0	0	1	0	1	0	1	0	1
Total Value Annual Increase	$194,700	$38,025	$63,630	$74,701	$79,482	$98,479	$105,335	$128,462	$138,277	$154,516
Annual Sales										
Heifer Calves (born this year)	0	0	0	0	0	0	0	0	5	5
Exposed Heifers	0	5	5	5	6	7	8	10	16	17
Herd Cows	0	0	0	0	0	0	0	0	0	0
Cull Cows For Slaughter[3]	0	0	1	1	1	2	2	2	3	3
Bull Calves (born this year)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls (yearlings)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls (2+ years old)[4]	0	0	0	0	0	0	0	0	0	0
Slaughter Bulls[6]	0	0	0	0	0	0	0	0	1	1
Breeding Bulls	0	0	0	0	0	0	0	0	0	0
Hunt Bulls[5]	0	0	0	0	5	8	8	8	10	10
Velvet Sales (lbs)	0	16	16	69	129	172	259	352	415	538
Total Value Of Annual Sales	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611

[3] includes any cull exposed heifers
[4] all sales of velvet bulls will be assumed to be 2 year old bulls
[5] all sales of hunt bulls will be assumed to be 3+ years old
[6] all cull slaughter bulls will be assumed to come from the 3+ yr old bulls

Ending Inventory										
Heifer Calves	15	7	11	12	14	17	19	22	20	21
Exposed Heifers	17	10	2	6	6	7	9	9	6	3
Herd Cows	0	17	25	26	31	36	41	47	54	57
Bull Calves	0	7	11	12	14	17	19	22	25	27
Velvet Bulls (yearlings)	0	0	7	11	12	14	17	19	22	25
Velvet Bulls (2 years old)	0	0	0	7	11	12	14	17	19	22
Velvet Bulls (3+ years old)	0	0	0	0	1	3	7	12	16	23
Breeding Bulls	1	1	1	2	2	3	3	4	4	5
Total Value Ending Inventory	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877	$650,576

Schedule 1C - Production Profile

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Calving Rate										
Cows	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Heifers	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Weaning Rate	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Cull Rate[1]										
Cows	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Heifers	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Breeding Bulls	Breeding bulls are replaced as required.									
Velvet Bulls	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Death Rate										
Cows & Heifers & Bulls	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Retention Rate[2]										
Heifers	100%	100%	100%	100%	100%	100%	100%	100%	80%	80%
Bull calves (for velvet herd & Hunt)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] cull rate refers to animals that are sold for slaughter, animals sold to other operations for breeding are entered as annual sales in schedule 2

[2] retention rate refers to the fraction of the calf crop that is retained to provide replacements for the breeding and velvet herds. Note that the high retention rates during the early years are needed to build the herd size.

Velvet Production per Bull	
4 Year Olds and Older	16.24
3 Year Olds	10.83
2 Year Olds	7.63
Yearlings	2.54

Schedule 2 - Inventory Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Inventory										
Heifer Calves	0	15	7	11	12	14	17	19	22	20
Exposed Heifers	0	17	10	2	6	6	7	9	9	6
Herd Cows	0	0	17	25	26	31	36	41	47	54
Bull Calves	0	0	7	11	12	14	17	19	22	25
Velvet Bulls (coming 2 years)	0	0	0	7	11	12	14	17	19	22
Velvet Bulls (coming 3 years)	0	0	0	0	7	11	12	14	17	19
Velvet Bulls (3+ years old)	0	0	0	0	0	1	3	7	12	16
Breeding Bulls	0	1	1	1	2	2	3	3	4	4
Total Value Opening Inventory	$0	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877
Annual Increase in Inventory										
Heifer Calves (weaned)	0	7	11	12	14	17	19	22	25	27
Heifer Calves(purchased)	15	0	0	0	0	0	0	0	0	0
Exposed Heifers (purchased)	17	0	0	0	0	0	0	0	0	0
Herd Cows (purchased)	0	0	0	0	0	0	0	0	0	0
Bull Calves (weaned)	0	7	11	12	14	17	19	22	25	27
Bull Calves (purchased)	0	0	0	0	0	0	0	0	0	0
Velvet bulls yearlings (purch)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls 2+ years old (purch)	0	0	0	0	0	0	0	0	0	0
Breeding bulls (purchased)	1	0	0	1	0	1	0	1	0	1
Total Value Annual Increase	$194,700	$38,025	$63,630	$74,701	$79,482	$98,479	$105,335	$128,462	$138,277	$154,516
Annual Sales										
Heifer Calves (born this year)	0	0	0	0	0	0	0	0	5	5
Exposed Heifers	0	5	5	5	6	7	8	10	16	17
Herd Cows	0	0	0	0	0	0	0	0	0	0
Cull Cows For Slaughter[3]	0	0	1	1	1	2	2	2	3	3
Bull Calves (born this year)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls (yearlings)	0	0	0	0	0	0	0	0	0	0
Velvet Bulls (2+ years old)[4]	0	0	0	0	0	0	0	0	0	0
Slaughter Bulls[4]	0	0	0	0	0	0	0	0	1	1
Breeding Bulls	0	0	0	0	0	0	0	0	0	0
Hunt Bulls[5]	0	0	0	0	6	8	8	8	10	10
Velvet Sales (lbs)	0	16	16	69	129	172	259	352	415	538
Total Value Of Annual Sales	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611

[3] includes any cull exposed heifers
[4] all sales of velvet bulls will be assumed to be 2 year old bulls
[5] all sales of hunt bulls will be assumed to be 3+ years old
[6] all cull slaughter bulls will be assumed to come from the 3+ yr old bulls

Ending Inventory										
Heifer Calves	15	7	11	12	14	17	19	22	20	21
Exposed Heifers	17	10	2	6	6	7	9	9	6	3
Herd Cows	0	17	25	26	31	36	41	47	54	57
Bull Calves	0	7	11	12	14	17	19	22	25	27
Velvet Bulls (yearlings)	0	0	7	11	12	14	17	19	22	25
Velvet Bulls (2 years old)	0	0	0	7	11	12	14	17	19	22
Velvet Bulls (3+ years old)	0	0	0	0	1	3	7	12	16	23
Breeding Bulls	1	1	1	2	2	3	3	4	4	5
Total Value Ending Inventory	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877	$650,576

Schedule 3A- Variable Expense

Item	Breeding Herd			Replacement Animals		Bulls	
	Annual Amount	Price Per Unit	Cost Per Breeding HD*	Annual Amount	Cost Per Replacement*	Annual Amount	Cost Per Bull*
Wages			**$50**		**$50**		**$50**
Grain (pounds barley)	0	**0.0400**	$0	0	$0	0	$0
Grain (pounds oats)	720	**0.0400**	$29	617	$25	900	$36
Hay (tonne)	0.82	**60.00**	$49	0.68	$41	0.98	$59
Supplement, Salt & Minerals (tonne)	0.18	**300.00**	$54	0.09	$27	0.18	$54
Veterinary Fees, Supplies			**$30**		**$25**		**$25**
Repairs & Maintenance			**$15**		**$15**		**$15**
Gas, Fuel & Oil			**$15**		**$15**		**$15**
Utilities			**$10**		**$10**		**$15**
Insurance			**$50**		**$5**		**$5**
Marketing & Transportation (per animal sold or purchased)			**$10**		**$10**		**$10**

* includes herd cow-calf pairs, and exposed heifers
* includes all weaned calves, both heifers and bulls
* includes both velvet and breeding bulls

Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Wages	**$152**	$1,650	$2,062	$2,906	$3,663	$4,608	$5,444	$6,401	$7,563	$8,283
Benefit (14% of wages)	$21	$231	$289	$407	$541	$645	$762	$896	$1,059	$1,160
Grain	**$308**	$896	$1,138	$1,636	$2,271	$2,726	$3,237	$3,822	$4,544	$5,026
Hay	**$300**	$1,507	$1,923	$2,742	$3,792	$4,545	$5,396	$6,368	$7,569	$8,360
Supplement with Salt & Minerals	**$80**	$1,377	$1,856	$2,518	$3,512	$4,202	$4,988	$5,887	$6,984	$7,733
Livestock Purchased	**$0**	$0	$0	$0	$0	$0	$0	$0	$0	$0
Breeding Stock Purchased	$194,700	$0	$0	$7,000	$0	$7,000	$0	$7,000	$0	$7,000
Veterinary Fees, Supplies	**$200**	$910	$1,163	$1,589	$2,094	$2,490	$2,937	$3,448	$4,063	$4,440
Repairs & Maintenance	**$80**	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Gas, Fuel & Oil	**$150**	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Utilities	**$50**	$335	$417	$620	$874	$1,053	$1,254	$1,483	$1,768	$1,962
Insurance	**$490**	$200	$200	$200	$200	$200	$200	$200	$200	$200
Marketing & Transportation	**$130**	$55	$61	$73	$134	$177	$181	$216	$341	$341
Death Loss*	**$0**	$5,841	$6,602	$7,489	$8,589	$11,116	$13,068	$15,131	$17,590	$18,506
Miscellaneous Expenses	**$300**	**$700**	**$700**	**$700**	**$700**	**$700**	**$700**	**$700**	**$700**	**$700**
Operating Interest	$14	$588	$706	$1,185	$1,196	$1,689	$1,857	$2,216	$2,277	$2,747
Total Variable Costs	$196,948	$15,280	$18,353	$30,807	$31,095	$43,917	$43,080	$57,609	$59,193	$71,430

* Death loss is calculated as a percent of the value of the entire herd

Schedule 3B - Depreciation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Acquistions:										
Land Improvements(5% DB)	$2,400	$0	$0	$2,400	$0	$0	$0	$0	$0	$0
Fencing and Handling Facilities (5% DB)	$36,640	$0	$0	$6,000	$0	$9,000	$9,000	$6,000	$0	$0
Loader, Trailor, Freezer and Miscellaneous (15% DB)	$20,000	$700	$5,000	$4,000	$700	$0	$700	$0	$0	$0
Truck and Tractor (30% DB)	$17,750	$0	$0	$5,000	$0	$0	$0	$0	$0	$0
Total Acquistions	$76,790	$700	$5,000	$17,400	$700	$9,000	$9,700	$6,000	$0	$0
Depreciation	$5,139	$9,211	$7,677	$7,774	$7,570	$6,387	$5,737	$5,211	$4,557	$3,891
Undepreciated Balance:										
Land Improvements(5% DB)	$2,340	$2,223	$2,112	$4,346	$4,129	$3,922	$3,726	$3,540	$3,363	$3,195
Fencing and Handling Facilities (10 % DB)	$34,808	$31,327	$28,194	$31,075	$27,968	$33,721	$38,899	$40,709	$36,638	$32,974
Loader, Trailor and Miscellaneous (15% DB)	$18,500	$16,373	$18,542	$19,460	$17,189	$14,611	$13,066	$11,106	$9,440	$8,024
Truck and Tractor (30% DB)	$15,088	$10,561	$7,393	$9,425	$6,598	$4,618	$3,233	$2,263	$1,584	$1,109
Total Undepreciated Balance	$70,736	$60,484	$56,241	$64,307	$55,883	$56,872	$58,924	$57,618	$51,026	$45,302

Schedule 3C - Interest Expense

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Principal	**$0**	$11,769	$12,710	$14,072	$16,399	$17,711	$19,749	$21,951	$24,121	$31,189
Interest	**$0**	$13,639	$12,698	$12,081	$12,347	$11,035	$10,338	$9,478	$8,202	$6,273
Total Payment		$25,408	$25,408	$26,153	$28,746	$28,746	$30,088	$31,429	$32,323	$37,462
Principal Outstanding	$170,490	$158,721	$151,011	$154,338	$137,939	$129,228	$118,479	$102,528	$78,408	$47,219

Schedule 3A- Variable Expense

Item	Breeding Herd			Replacement Animals		Bulls	
	Annual Amount	Price Per Unit	Cost Per Breeding HD'	Annual Amount	Cost Per Replacement*	Annual Amount	Cost Per Bull*
Wages			$50		$50		$50
Grain (pounds barley)	0	0.0400	$0	0	$0	0	$0
Grain (pounds oats)	720	0.0400	$29	617	$25	900	$36
Hay (tonne)	0.82	60.00	$49	0.68	$41	0.98	$59
Supplement, Salt & Minerals (tonne)	0.18	300.00	$54	0.09	$27	0.18	$54
Veterinary Fees, Supplies			$30		$25		$25
Repairs & Maintenance			$15		$15		$15
Gas, Fuel & Oil			$15		$15		$15
Utilities			$10		$10		$15
Insurance			$50		$5		$5
Marketing & Transportation (per animal sold or purchased)			$10		$10		$10

' includes herd cow-calf pairs, and exposed heifers
* includes all weaned calves, both heifers and bulls
" includes both velvet and breeding bulls

Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Wages	$152	$1,650	$2,062	$2,906	$3,863	$4,608	$5,444	$6,401	$7,563	$8,283
Benefit (14% of wages)	$21	$231	$289	$407	$541	$645	$762	$896	$1,059	$1,160
Grain	$300	$896	$1,138	$1,636	$2,271	$2,725	$3,237	$3,822	$4,544	$5,026
Hay	$300	$1,507	$1,923	$2,742	$3,792	$4,545	$5,396	$6,368	$7,565	$8,360
Supplement with Salt & Minerals	$80	$1,377	$1,856	$2,518	$3,512	$4,202	$4,988	$5,887	$6,984	$7,733
Livestock Purchased	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Breeding Stock Purchased	$194,700	$0	$0	$7,000	$0	$7,000	$0	$7,000	$0	$7,000
Veterinary Fees, Supplies	$200	$910	$1,163	$1,589	$2,094	$2,490	$2,937	$3,448	$4,063	$4,440
Repairs & Maintenance	$80	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Gas, Fuel & Oil	$150	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Utilities	$50	$335	$417	$620	$874	$1,053	$1,254	$1,483	$1,768	$1,962
Insurance	$490	$200	$200	$200	$200	$200	$200	$200	$200	$200
Marketing & Transportation	$130	$55	$61	$73	$134	$177	$181	$216	$341	$341
Death Loss*	$0	$5,841	$6,602	$7,489	$9,599	$11,116	$13,068	$15,131	$17,590	$18,506
Miscellaneous Expenses	$300	$700	$700	$700	$700	$700	$700	$700	$700	$700
Operating Interest	$14	$588	$706	$1,185	$1,196	$1,689	$1,657	$2,216	$2,277	$2,747
Total Variable Costs	$196,948	$15,280	$18,353	$30,807	$31,095	$43,917	$43,090	$57,609	$59,193	$71,430

* Death loss is calculated as a percent of the value of the entire herd

Schedule 3B - Depreciation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Acquistions:										
Land Improvements(5% DB)	$2,400	$0	$0	$2,400	$0	$0	$0	$0	$0	$0
Fencing and Handling Facilities (5% DB)	$36,640	$0	$0	$6,000	$0	$9,000	$9,000	$6,000	$0	$0
Loader, Trailor, Freezer and Miscellaneous (15% DB)	$20,000	$700	$5,000	$4,000	$700	$0	$700	$0	$0	$0
Truck and Tractor (30% DB)	$17,750	$0	$0	$5,000	$0	$0	$0	$0	$0	$0
Total Acquistions	$76,790	$700	$5,000	$17,400	$700	$9,000	$9,700	$6,000	$0	$0
Depreciation	$5,139	$9,211	$7,677	$7,774	$7,570	$6,387	$5,737	$5,211	$4,557	$3,891
Undepreciated Balance:										
Land Improvements(5% DB)	$2,340	$2,223	$2,112	$4,346	$4,129	$3,922	$3,726	$3,540	$3,363	$3,195
Fencing and Handling Facilities (10 % DB)	$34,808	$31,327	$28,194	$31,075	$27,968	$33,721	$38,899	$40,709	$36,638	$32,974
Loader, Trailor and Miscellaneous (15% DB)	$18,500	$16,373	$18,542	$19,460	$17,189	$14,611	$13,066	$11,106	$9,440	$8,024
Truck and Tractor (30% DB)	$15,088	$10,561	$7,393	$9,425	$6,598	$4,618	$3,233	$2,263	$1,584	$1,109
Total Undepreciated Balance	$70,736	$60,484	$56,241	$64,307	$55,883	$56,872	$58,924	$57,618	$51,026	$45,302

Schedule 3C - Interest Expense

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Principal	$0	$11,769	$12,710	$14,072	$16,399	$17,711	$19,749	$21,951	$24,121	$31,189
Interest	$0	$13,639	$12,698	$12,081	$12,347	$11,035	$10,338	$9,478	$8,202	$6,273
Total Payment		$25,408	$25,408	$26,153	$28,746	$28,746	$30,088	$31,429	$32,323	$37,462
Principal Outstanding	$170,490	$158,721	$151,011	$154,338	$137,939	$129,228	$118,479	$102,528	$78,408	$47,219

Schedule 4 - Projected Cash Costs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Wages	$152	$1,650	$2,062	$2,906	$3,863	$4,608	$5,444	$6,401	$7,563	$8,283
Benefits	$21	$231	$289	$407	$541	$645	$762	$896	$1,059	$1,160
Grain	$300	$896	$1,138	$1,636	$2,271	$2,725	$3,237	$3,822	$4,544	$5,026
Hay	$300	$1,507	$1,923	$2,742	$3,792	$4,545	$5,396	$6,368	$7,565	$8,360
Salt & Minerals	$60	$1,377	$1,856	$2,518	$3,512	$4,202	$4,988	$5,887	$6,984	$7,733
Livestock Purchased	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Breeding Stock Purchased	$194,700	$0	$0	$7,000	$0	$7,000	$0	$7,000	$0	$7,000
Veterinary Fees & Supplies	$200	$910	$1,163	$1,589	$2,094	$2,490	$2,937	$3,448	$4,063	$4,440
Repairs & Maintenance	$80	$496	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Gas, Fuel & Oil	$150	$496	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Utilities	$50	$335	$417	$620	$874	$1,053	$1,254	$1,483	$1,768	$1,962
Insurance	$490	$200	$200	$200	$200	$200	$200	$200	$200	$200
Marketing & Transportation	$130	$55	$61	$73	$134	$177	$181	$216	$341	$341
Death Replacement Cost	$0	$5,841	$6,602	$7,489	$9,599	$11,116	$13,068	$15,131	$17,590	$18,506
Property Taxes	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400
Principal Payments	$0	$11,769	$12,710	$14,072	$16,399	$17,711	$19,749	$21,951	$24,121	$31,189
Interest Payments	$0	$13,851	$13,099	$12,829	$14,217	$12,001	$10,338	$9,478	$8,202	$6,273
Miscellaneous	$300	$700	$700	$700	$700	$700	$700	$700	$700	$700
Operating Interest	$14	$588	$706	$1,185	$1,196	$1,689	$1,657	$2,216	$2,277	$2,747
Total Cash Costs	$197,348	$41,299	$44,563	$58,108	$62,111	$74,029	$73,577	$89,436	$91,916	$109,291

NOTE: Columns may not add due to rounding.

Schedule 5 - Projected Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Income:										
Livestock and Velvet Sales	$0	$39,632	$40,229	$44,090	$74,112	$90,958	$108,100	$127,328	$203,543	$221,611
Change In Inventory	$194,700	$25,357	$29,575	$70,333	$50,562	$65,064	$68,787	$81,954	$30,544	$33,700
Other Sales	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Income	$194,700	$64,988	$69,803	$114,422	$124,674	$156,022	$173,887	$209,282	$234,087	$255,310
Cash Costs(excl. prin. payments)	$197,348	$29,531	$31,852	$44,036	$45,712	$56,317	$53,828	$67,487	$67,795	$78,102
Net Income Before Depreciation	($2,648)	$35,458	$37,951	$70,386	$78,963	$99,705	$120,060	$141,795	$166,292	$177,208
Depreciation	$5,139	$9,211	$7,677	$7,774	$7,570	$6,387	$5,737	$5,211	$4,557	$3,891
Net Income Of Business	($7,786)	$26,247	$30,274	$62,612	$71,393	$93,318	$114,323	$136,584	$161,734	$173,317

NOTE: Columns may not add due to rounding.

Schedule 6 - Projected Cash Flow Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash Income:										
Livestock and Velvet Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Other Cash Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cash Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Cash Costs	$197,348	$41,299	$44,563	$58,108	$62,111	$74,028	$73,577	$89,438	$91,916	$109,291
Net Cash Income	($197,348)	($1,668)	($4,334)	($14,019)	$12,001	$16,930	$31,523	$37,890	$111,627	$112,320
Capital Inflow										
Initial Equity	$125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Term Loan	$170,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Total Capital Inflow	$295,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Capital Outflow:										
Land	$24,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pasture Renovations	$2,400	$0	$0	$2,400	$0	$0	$0	$0	$0	$0
Fencing	$16,640	$0	$0	$0	$0	$9,000	$9,000	$6,000	$0	$0
Handling Facilities	$20,000	$0	$0	$6,000	$0	$0	$0	$0	$0	$0
Loader, Freezer and Trailer	$15,000	$700	$5,000	$4,000	$700	$0	$700	$0	$0	$0
Truck and Tractor	$17,750	$0	$0	$5,000	$0	$0	$0	$0	$0	$0
Miscellaneous Equipment	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Outflow	$100,790	$700	$5,000	$17,400	$700	$9,000	$9,700	$6,000	$0	$0
Cash Surplus (Shortfall)	($2,648)	($2,368)	($4,334)	($14,019)	$11,301	$16,930	$30,823	$37,890	$111,627	$112,320
Cumulative Surplus (Shortfall)	($2,648)	($5,016)	($9,350)	($23,369)	($12,068)	$4,862	$35,685	$73,575	$185,202	$297,522

NOTE: columns may not add due to rounding.

Schedule 4 - Projected Cash Costs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Wages	$152	$1,650	$2,062	$2,906	$3,863	$4,608	$5,444	$6,401	$7,563	$8,283
Benefits	$21	$231	$289	$407	$541	$645	$762	$896	$1,059	$1,160
Grain	$300	$896	$1,138	$1,636	$2,271	$2,725	$3,237	$3,822	$4,544	$5,026
Hay	$300	$1,507	$1,923	$2,742	$3,792	$4,545	$5,396	$6,368	$7,565	$8,360
Salt & Minerals	$60	$1,377	$1,856	$2,518	$3,512	$4,202	$4,988	$5,887	$6,984	$7,733
Livestock Purchased	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Breeding Stock Purchased	$194,700	$0	$0	$7,000	$0	$7,000	$0	$7,000	$0	$7,000
Veterinary Fees & Supplies	$200	$910	$1,163	$1,589	$2,094	$2,490	$2,937	$3,448	$4,063	$4,440
Repairs & Maintenance	$80	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Gas, Fuel & Oil	$150	$495	$618	$872	$1,159	$1,383	$1,633	$1,920	$2,269	$2,485
Utilities	$50	$335	$417	$620	$874	$1,053	$1,254	$1,483	$1,768	$1,962
Insurance	$490	$200	$200	$200	$200	$200	$200	$200	$200	$200
Marketing & Transportation	$130	$55	$61	$73	$134	$177	$181	$216	$341	$341
Death Replacement Cost	$0	$5,841	$6,602	$7,489	$9,599	$11,116	$13,068	$15,131	$17,590	$18,506
Property Taxes	**$400**	**$400**	**$400**	**$400**	**$400**	**$400**	**$400**	**$400**	**$400**	**$400**
Principal Payments	$0	$11,769	$12,710	$14,072	$16,399	$17,711	$19,749	$21,951	$24,121	$31,189
Interest Payments	$0	$13,851	$13,099	$12,829	$14,217	$12,001	$10,338	$9,478	$8,202	$6,273
Miscellaneous	$300	$700	$700	$700	$700	$700	$700	$700	$700	$700
Operating Interest	$14	$588	$706	$1,185	$1,196	$1,689	$1,657	$2,216	$2,277	$2,747
Total Cash Costs	$197,348	$41,299	$44,563	$58,108	$62,111	$74,028	$73,577	$89,438	$91,916	$109,291

NOTE: Columns may not add due to rounding.

Schedule 5 - Projected Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Income:										
Livestock and Velvet Sales	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Change In Inventory	$194,700	$25,357	$29,575	$70,333	$50,562	$65,064	$68,787	$81,954	$30,544	$33,700
Other Sales	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Income	$194,700	$64,988	$69,803	$114,422	$124,674	$156,022	$173,887	$209,282	$234,087	$255,310
Cash Costs(excl. prin. payments)	$197,348	$29,531	$31,852	$44,036	$45,712	$56,317	$53,828	$67,487	$67,795	$78,102
Net Income Before Depreciation	($2,648)	$35,458	$37,951	$70,386	$78,963	$99,705	$120,060	$141,795	$166,292	$177,208
Depreciation	$5,139	$9,211	$7,677	$7,774	$7,570	$6,387	$5,737	$5,211	$4,557	$3,891
Net Income Of Business	($7,786)	$26,247	$30,274	$62,612	$71,393	$93,318	$114,323	$136,584	$161,734	$173,317

NOTE: Columns may not add due to rounding.

Schedule 6 - Projected Cash Flow Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash Income:										
Livestock and Velvet Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Other Cash Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cash Income	$0	$39,632	$40,228	$44,090	$74,112	$90,958	$105,100	$127,328	$203,543	$221,611
Cash Costs	$197,348	$41,299	$44,563	$58,108	$62,111	$74,028	$73,577	$89,438	$91,916	$109,291
Net Cash Income	($197,348)	($1,668)	($4,334)	($14,019)	$12,001	$16,930	$31,523	$37,890	$111,627	$112,320
Capital Inflow										
Initial Equity	$125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Term Loan	$170,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Total Capital Inflow	$295,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Capital Outflow:										
Land	$24,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Pasture Renovations	$2,400	$0	$0	$2,400	$0	$0	$0	$0	$0	$0
Fencing	$16,640	$0	$0	$0	$0	$9,000	$9,000	$6,000	$0	$0
Handling Facilities	$20,000	$0	$0	$8,000	$0	$0	$0	$0	$0	$0
Loader, Freezer and Trailer	$15,000	$700	$5,000	$4,000	$700	$0	$700	$0	$0	$0
Truck and Tractor	$17,750	$0	$0	$5,000	$0	$0	$0	$0	$0	$0
Miscellaneous Equipment	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Outflow	$100,790	$700	$5,000	$17,400	$700	$9,000	$9,700	$6,000	$0	$0
Cash Surplus (Shortfall)	($2,648)	($2,368)	($4,334)	($14,019)	$11,301	$16,930	$30,823	$37,890	$111,627	$112,320
Cumulative Surplus (Shortfall)	($2,648)	($5,016)	($9,350)	($23,369)	($12,068)	$4,862	$35,685	$73,575	$185,202	$297,522

NOTE: columns may not add due to rounding

Schedule 7 - Projected Balance Sheet

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets:										
Cash	$0	$0	$0	$0	$0	$4,862	$35,685	$73,575	$185,202	$297,522
Inventory	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877	$650,576
Total Current Assets	$194,700	$220,057	$249,632	$319,964	$370,527	$440,453	$540,063	$659,908	$802,079	$948,098
Fixed Assets:										
Land	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Land Improvement and Facilities	$39,040	$39,040	$39,040	$47,440	$47,440	$56,440	$65,440	$71,440	$71,440	$71,440
Equipment	$37,750	$38,450	$43,450	$52,450	$53,150	$53,150	$53,850	$53,850	$53,850	$53,850
Less Accumulated Depreciation	$5,139	$14,350	$22,026	$29,801	$37,371	$43,758	$49,495	$54,706	$59,263	$63,155
Net Fixed Assets	$95,652	$87,140	$84,464	$94,089	$87,219	$89,832	$93,795	$94,584	$90,027	$86,135
Total Assets	$290,352	$307,197	$334,095	$414,054	$457,746	$530,285	$633,858	$754,492	$892,105	$1,034,233
Current Liabilities:										
Term Loan - Current Portion										
Accounts Payable	$2,648	$5,016	$9,350	$23,369	$12,068	$0	$0	$0	$0	$0
Total Current Liabilities	$2,648	$5,016	$9,350	$23,369	$12,068	$0	$0	$0	$0	$0
Long Term Liabilities:										
Term Loan	$170,490	$158,721	$151,011	$154,338	$137,939	$129,228	$118,479	$102,528	$78,408	$47,219
Total Liabilities	$173,138	$163,737	$160,361	$177,707	$150,007	$129,228	$118,479	$102,528	$78,408	$47,219
Business Equity	$117,214	$143,461	$173,735	$236,346	$307,739	$401,057	$515,379	$651,963	$813,698	$987,015
Total Liabilities Plus Equity	$290,352	$307,197	$334,095	$414,054	$457,746	$530,285	$633,858	$754,492	$892,105	$1,034,233

Schedule 8 - Projected Payment Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Term Of Loan (Years)	10	10	10	10	10	10	10	10	10	10
Amount Borrowed	$170,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Annual Payments For This Loan	$25,408	$0	$745	$2,593	$0	$1,341	$1,341	$894	$0	$0
Total Annual Payments		$25,408	$25,408	$26,153	$28,746	$28,746	$30,088	$31,429	$32,323	$37,462

Schedule 7 - Projected Balance Sheet

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets:										
Cash	$0	$0	$0	$0	$0	$4,862	$35,685	$73,575	$185,202	$297,522
Inventory	$194,700	$220,057	$249,632	$319,964	$370,527	$435,591	$504,378	$586,332	$616,877	$650,576
Total Current Assets	$194,700	$220,057	$249,632	$319,964	$370,527	$440,453	$540,063	$659,908	$802,079	$948,098
Fixed Assets:										
Land	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
Land Improvement and Facilities	$39,040	$39,040	$39,040	$47,440	$47,440	$56,440	$65,440	$71,440	$71,440	$71,440
Equipment	$37,750	$38,450	$43,450	$52,450	$53,150	$53,150	$53,850	$53,850	$53,850	$53,850
Less Accumulated Depreciation	$5,139	$14,350	$22,026	$29,801	$37,371	$43,758	$49,495	$54,706	$59,263	$63,155
Net Fixed Assets	$95,652	$87,140	$84,464	$94,089	$87,219	$89,832	$93,795	$94,584	$90,027	$86,135
Total Assets	$290,352	$307,197	$334,095	$414,054	$457,746	$530,285	$633,858	$754,492	$892,105	$1,034,233
Current Liabilities:										
Term Loan - Current Portion										
Accounts Payable	$2,648	$5,016	$9,350	$23,369	$12,068	$0	$0	$0	$0	$0
Total Current Liabilities	$2,648	$5,016	$9,350	$23,369	$12,068	$0	$0	$0	$0	$0
Long Term Liabilities:										
Term Loan	$170,490	$158,721	$151,011	$154,338	$137,939	$129,228	$118,479	$102,528	$78,408	$47,219
Total Liabilities	$173,138	$163,737	$160,361	$177,707	$150,007	$129,228	$118,479	$102,528	$78,408	$47,219
Business Equity	$117,214	$143,461	$173,735	$236,346	$307,739	$401,057	$515,379	$651,963	$813,698	$987,015
Total Liabilities Plus Equity	$290,352	$307,197	$334,095	$414,054	$457,746	$530,285	$633,858	$754,492	$892,105	$1,034,233

Schedule 8 - Projected Payment Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Term Of Loan (Years)	10	10	10	10	10	10	10	10	10	10
Amount Borrowed	$170,490	$0	$5,000	$17,400	$0	$9,000	$9,000	$6,000	$0	$0
Annual Payments For This Loan	$25,408	$0	$745	$2,593	$0	$1,341	$1,341	$894	$0	$0
Total Annual Payments		$25,408	$25,408	$26,153	$28,746	$28,746	$30,088	$31,429	$32,323	$37,462

Appendix II: Elk Processors, Wholesalers and Distributors

1. Elk Velvet Antler Processors

Velvet Independent Processors (VIP)
Dean Skinner
Box 729
Wilkie, Saskatchewan S0K 4W0
Phone: (306) 843 3557
Fax: (306) 843-3558

LifeQuest Nutrients Inc.
(in association with Redwater River Ranch)
Russell Lakusta
Box 10
Opal, Alberta T0A 2R0
Phone: (780) 942-4606
Fax: (780) 942-2670

Elk Valley Processors
Frank McAllister
Box 188
Kitscoty, Alberta T0B 2P0
Phone: (780) 846-2980
Fax: (780) 846-2066

InnerSense International Inc.
Steve Kurylo
Box 3292
Sherwood Park, Alberta T8A 2A6
Phone: (780) 467-0471
Fax: (780) 449-1909

Royal Elk Products
Don Bamber
Box 403
Sangudo, Alberta T0E 2A0
Phone (780) 785-3558
Fax: (780) 785-3379

Elk Tech International
Robert Pek
Suite #205 - 3016 19th Street N.E.
Calgary, Alberta T2E 6Y9
Phone: (403) 250-8852
Fax: (403) 250-8928

Parkland Processors Ltd.
Lee Han
Calgary, Alberta
Phone: (403) 230-5837
Fax: (403) 815-9887

2. Elk Slaughter and/or Meat Processing Facilities

Company	City	Province
Federally Licensed Plants and Processors:		
Winkler Meats Ltd.	Winkler	Manitoba
Plains Processors Ltd.	Carman	Manitoba
Provincially Inspected Plants:		
Country Choice Meats	Duck Lake	Saskatchewan
Kindersley Packers	Kindersley	Saskatchewan
Drake Meat Processors	Drake	Saskatchewan
Wadena Meats	Wadena	Saskatchewan
Watson Meat Processors	Watson	Saskatchewan

3. Elk Meat Wholesalers and/or Distributors

Company	City	Province
Albion Fisheries Ltd.	Vancouver	British Columbia
Centennial Foodservice	Edmonton, Calgary Regina, Saskatoon	Alberta Saskatchewan
Drake Meat Processors	Drake	Saskatchewan
Hills Foods Ltd.	Burnaby	British Columbia
Horizon Meats	Calgary	Alberta
North Country Bison Meats Ltd.	Edmonton	Alberta
Northern Velvet	Merritt	British Columbia
Western Quality Meats	Calgary	Alberta

Appendix III: Elk Handling System

(This publication was originally printed in 1995 as "Ground Level Elk Handling Facilities", Brian Campbell, Saskatchewan Agriculture and Food FarmFacts EXE0495. Design credits to Safe Side Systems Ltd., Winfield, Alberta)

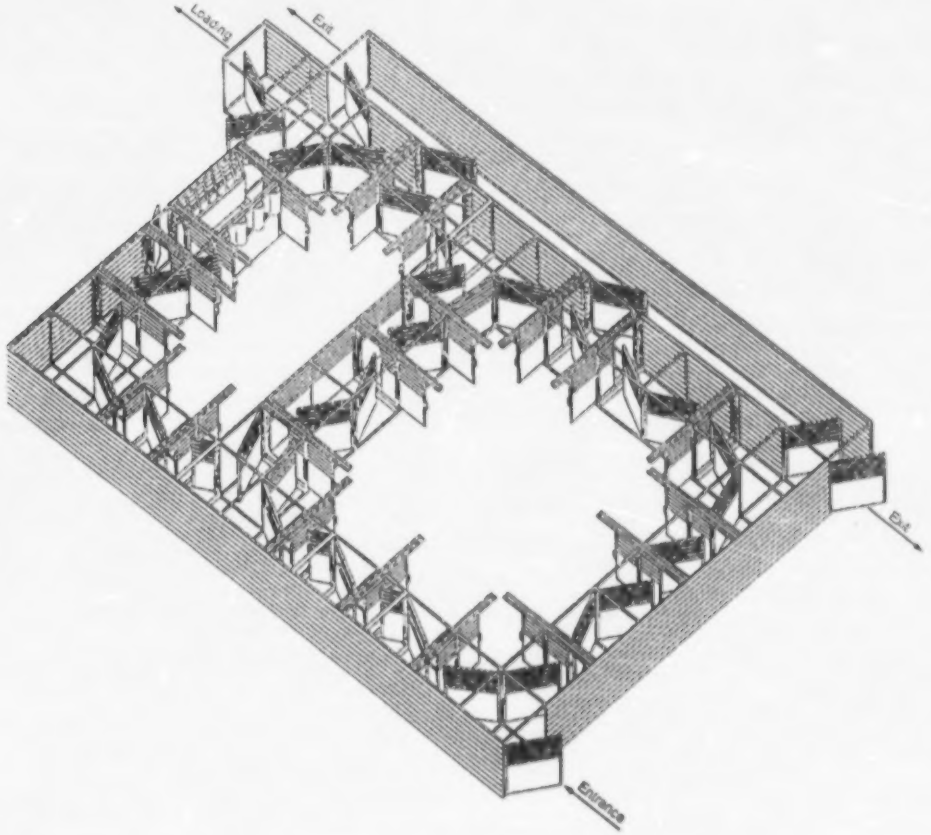
This appendix describes a relatively new approach to handling elk. Drawings and designs are based on handling systems built by Safe Side Systems Ltd. of Winfield, Alberta. The advantages offered by this design include effective and efficient animal movement, construction flexibility and adaptability, and improved animal and operator safety. Staged construction allows expansion or modification of facilities as requirements or finances dictate. Some producers have designed and constructed systems that can handle several different livestock species effectively.

Construction suggestions and operational tips for the system are described within this appendix. Although the dimensional pipe shown in the diagrams is 2 3/8-inch drill-stem, comparable materials can be substituted provided dimensions are adjusted accordingly.

Construction Guidelines

A ground-level system is a series of swinging gate and sliding gate modules. These modules are typically five or six feet square and may be arranged in a U-shape or rectangular shape. The

Figure 1: Perspective of System



"wide alley" allows a continuous flow of animals to be handled in groups and offers them room to turn around. The operator works at ground level from the centre. Each combination of swinging gate and sliding gate can be used to hold, separate and move the elk. The swinging gates may be used to "sweep" the animals out of the module if necessary, while maintaining operator safety behind the gate. Figure 1 shows a three-dimensional view of a facility.

The bottom four feet of all swinging and sliding gates is constructed of solid material. Plank or panel construction may be used for the lower section; however, it must be both durable to withstand kicking and smooth to prevent injury. Spaced pipe is used for the upper section. The pipe spacing should not exceed 4½ inches in order to prevent animal injuries.

Figure 2 gives suggested construction details of the swinging gate. Note that the swinging gate can be locked in both the open and closed position. The latch is a half-inch U-shaped rod that straddles the pipe frame uprights. Stronger latches may be needed in facilities that experience greater animal pressure. A self-locking tab prevents the latch from being accidentally opened. Latches should never be located on the animal side of the system. The construction shown in Figure 2 maintains clear access of five feet inside the module.

Figure 3 gives suggested construction details of the sliding gate. The track is conventional heavy-duty door track fastened to the gate frame. Guide bars (one on each side) are attached rigidly to the frame at the top of the gate to prevent the gate from twisting when partially open.

Drawings in Figures 2, 3 and 4 are shown as complete stand-alone modules. Each module can be bolted, clamped or welded to any adjacent module. With less modular off-site construction and more direct on-site fabrication, the amount of pipe framing can be substantially reduced as adjacent gate units share common framing.

It is recommended that elk should have about eight feet of unobstructed height inside the modules. However, the overall height of the module units shown in this appendix are eight feet in order to fit inside existing buildings with eight foot ceilings. The clear height inside the modules is therefore eight feet minus the diameter of the top crossover pipe.

Variations of the swinging gate module may be used within this system. These variations include the corners, double gate units and an in-module squeeze.

The system can be used either inside a building or outside. The walls of a building can be incorporated into the design of a system to allow greater handling flexibility and should be a minimum of eight feet in height. These perimeter walls can be freestanding post and plank construction placed adjacent to the steel modules. It is important that narrow spacings be used throughout the system to prevent hooves and antlers from being caught and injured.

When a new building is being constructed specifically for a ground-level handling system, the recommended ceiling height is 12 feet. This additional height allows for adequate ventilation and proper lighting.

The corners of gates and frames are shown with 45 degree mitered connections made using a cut-off wheel. If crimped butt-joints are used, arrange the joints so water from rain, snow and condensation will drain from the pipes. Rounded, bent pipe corners are not recommended for gate and frame construction due to the possibility, however unlikely, of animal injury.

Figure 5 illustrates one handling facility. It is the plan view of Figure 1 with minor changes for placement inside a building.

If producers start with only a few animals, they may not want to initially commit the money or the time to build an elaborate system. An example of a staged construction is shown in Figure 6. The slide and swing gates are the primary functional components of the system. When reducing the number of gates in a staged construction, remember that handling effectiveness will be comparably reduced.

The plan view in Figure 5 gives an example of how a handling system can be arranged. Since the modular system is highly adaptable, the direction of gate swing and the number swinging gates is variable and dependent upon the handling characteristics required by the individual elk producer. Producers must design accordingly to

meet their requirements and to accommodate any site restrictions. Since concrete floors offer poor traction, thereby increasing slipping and the possibility for animal injury, their use is not recommended. If concrete flooring must be used, adequate steps need to be taken to improve traction and ensure animal safety.

A padded hydraulic squeeze that can restrain the animal works well for veterinary treatment and for removing velvet antler. It is critical also to plan the operators' working space: the efficiency of animal handling is directly related to the organization of the operator.

Operational Guidelines

Animals enter this system at one corner (Item 1, Figure 5) from outside lead-up alleys and sorting pens. When the elk enter, all slide gates are left in the open position and all swinging gates are locked parallel to the system. This allows the animals to enter the facility and encounter no dead ends. The elk will continuously move through the system and eventually quiet down. Once the animals are settled, the slide gates are systematically closed until two or three animals are confined in each of the modules. Elk confined in this manner usually remain quiet even with the handler visible through the fence.

Operate the gates calmly and quietly. Avoid loud noises and quick movements. If the sliding gates are operated properly, the elk can eventually be reduced to one animal per five by five foot. module. They can be moved towards the squeeze (Item 5, Figure 5) efficiently as required.

Item 2 of Figure 5 is an optional 7½-foot. long unit that can be used to confine a single animal for treatment without requiring a squeeze. The module is set up with only one animal present. The five foot swinging gate can then be swung and locked to restrain the animal against the sliding gate.

The system shown in all of the diagrams is designed for clockwise movement of the animals. However, some swinging gates are hung to make reverse movement possible and to add another degree of flexibility to the system.

The alley shown as Item 6 in Figure 5 may be used for further animal sorting. Calves can be separated from cows, animals not requiring treatment can be released, or animals can be circulated back through the system ahead of others. This alley adds versatility to the system. Add as many gates as deemed necessary, keeping in mind that long alleyways may encourage high animal speeds and increase the risk of animal injury.

The loading chute at one corner is an extension of the handling system. A swinging gate blocks the loading chute while allowing operator access to the back of a trailer or truck. It is important to remember that any gaps between the handling facility and trailer represent one of the highest areas for potential escapes.

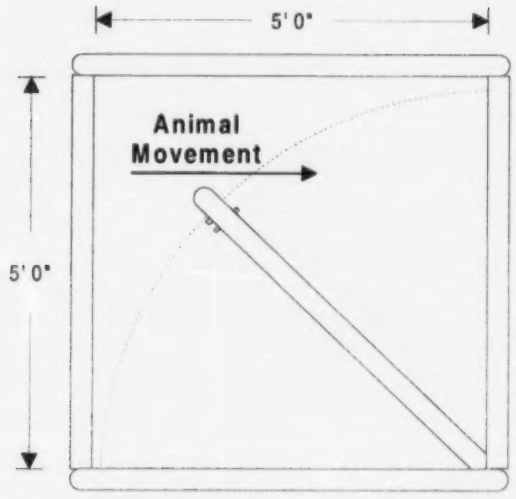
Animals must leave the handling system into an unobstructed area to prevent injury. They should exit into a large pen having no sharp corners, protrusions or other obstacles.

This appendix does not show all the details necessary to build the system. It is intended to be used as a guide. On-site ingenuity based on cost, management goals, materials and personal preference will determine the final appearance.

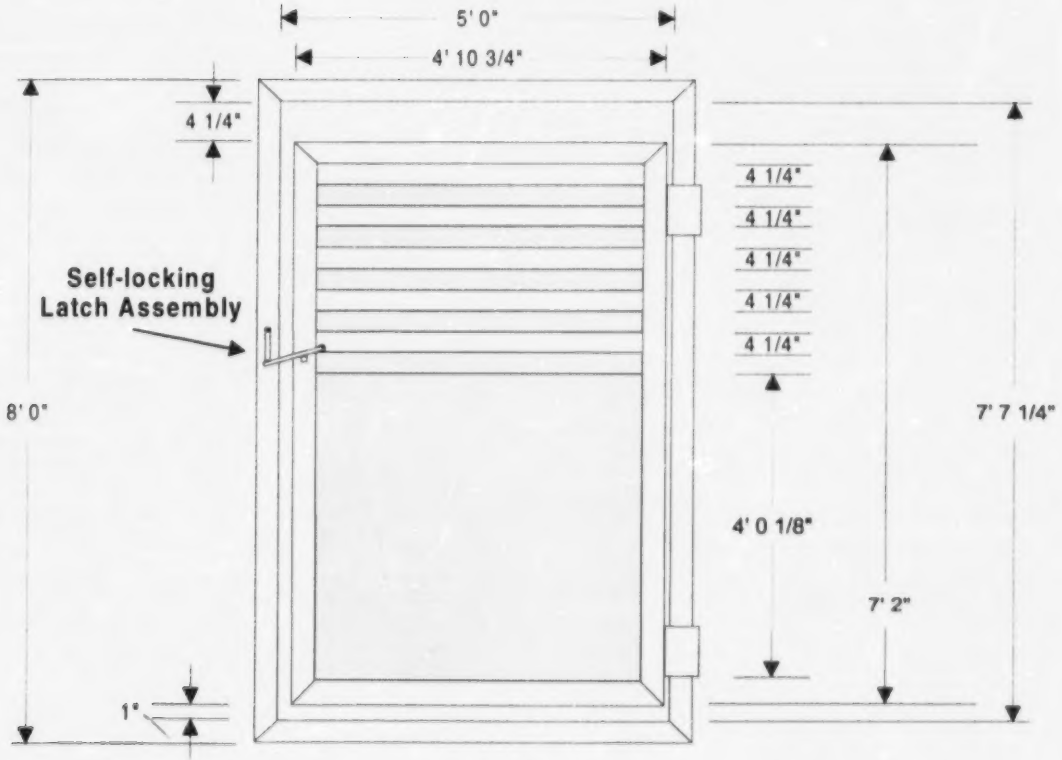
Credits:

SAFE SIDE SYSTEMS LTD.
Michael McCabe - Manager
John Cameron - Owner
Box 36, RR#1
Winfield, Alberta, Canada T0C 2X0
Phone: 780-682-2008
Fax: 780-682-2346

Figure 2: Single Swing Gate Module



Top View



Side View

Figure 3. Sliding Gate Module

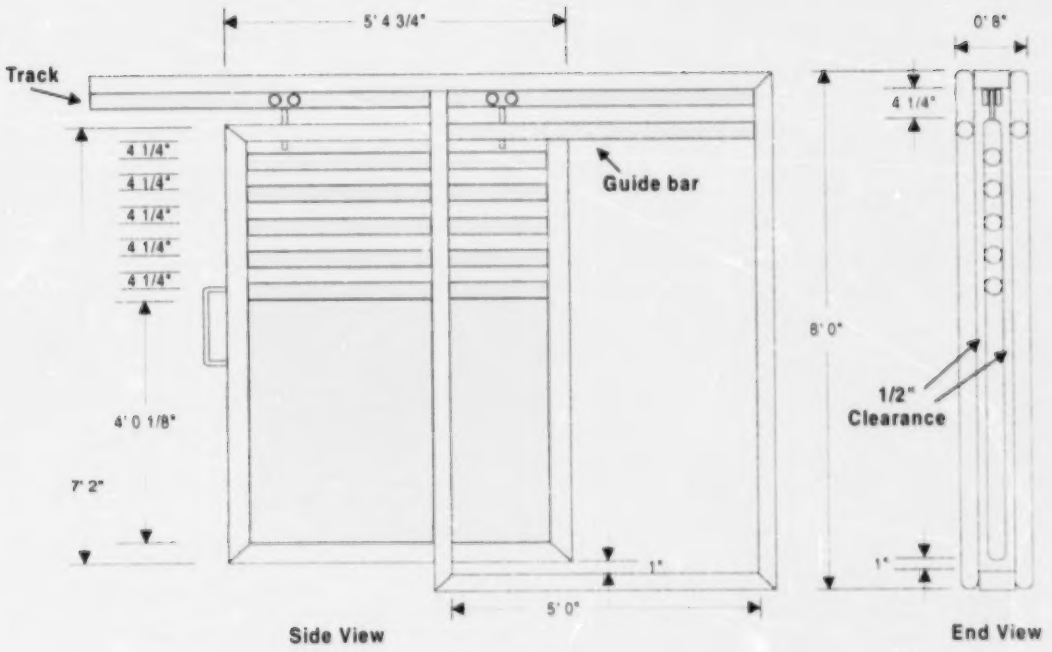


Figure 4. Double Swing Gates Module

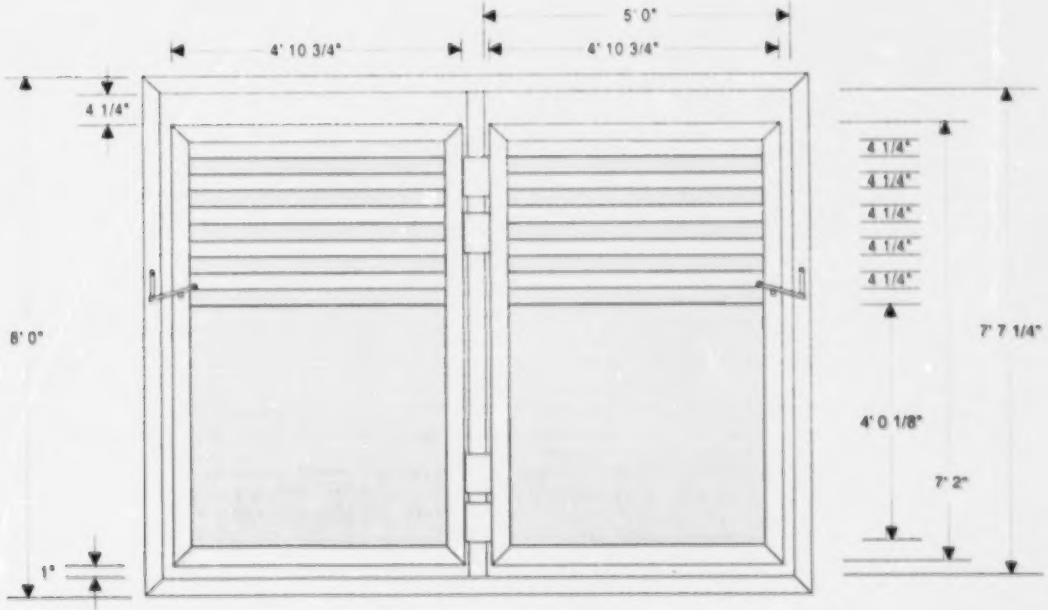
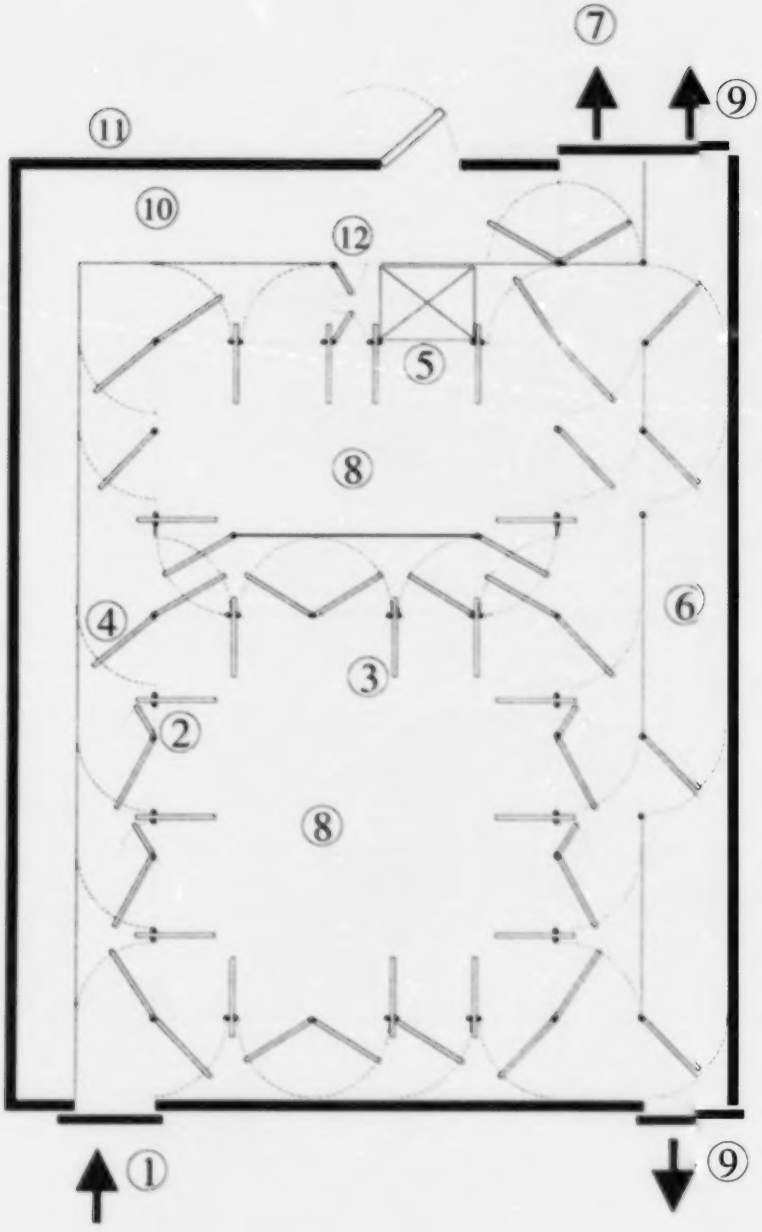
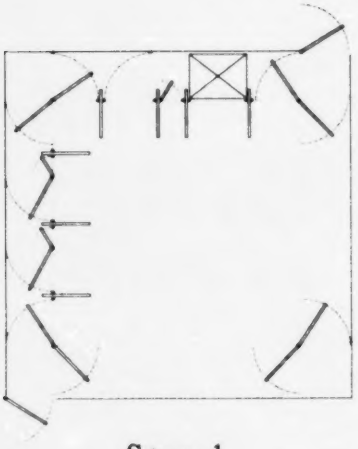


Figure 5. A Completed Example System

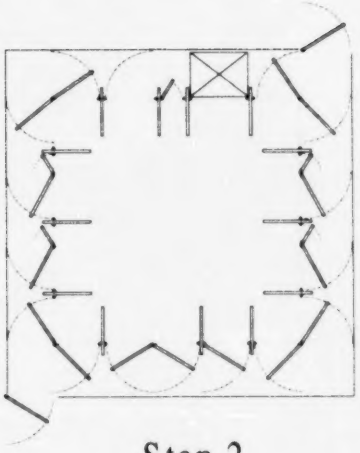


1. Entrance
2. In-chute squeeze
3. Sliding gate
4. Swinging gate
5. Squeeze/Crush
6. Sorting alley
7. To loading chute
8. Operator working area
9. Exits
10. Storage
11. Building
12. Operator access gates

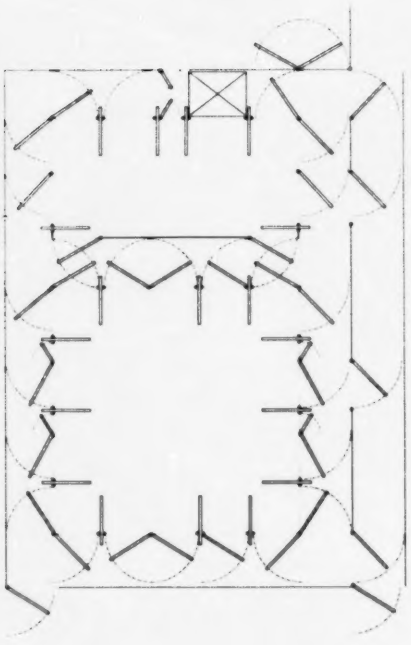
Figure 6: Staged Construction



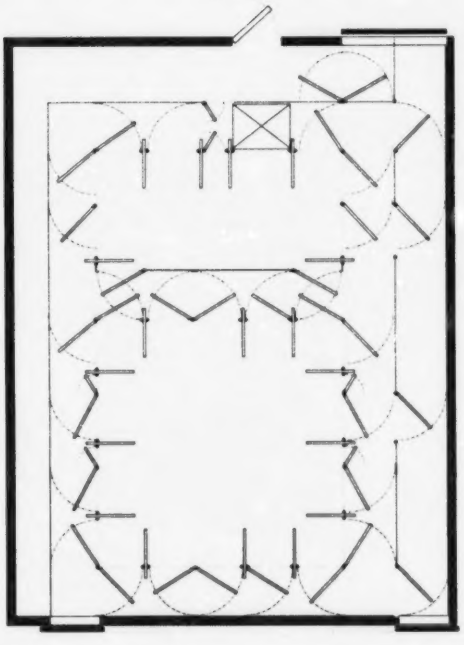
Step 1



Step 2



Step 3



Step 4

Appendix IV: Wapiti Nutrition And Feed Testing Results

(This bulletin was originally printed in 1996 as " Wapiti Nutrition And Feed Testing Results", Murray Feist, University of Saskatchewan, Department of Animal and Poultry Science. For further information contact Murray Feist, Extension-Research Unit, Saskatchewan Agriculture and Food, Room 2D-18 College of Agriculture, University of Saskatchewan, Saskatoon, SK, S7N 5A8)

Listed below is a description of the nutritional components of feed reported in a Feed Analysis Report, followed by some suggested nutritional requirements for wapiti.

Component Descriptions

100% Dry Matter	Most nutritional requirements for wapiti are described on a dry matter basis. Dry matter is a descriptive way of comparing different feedstuffs on the same moisture level.
As Fed	As Fed describes the "as received" nutrient content based on the actual moisture level of the feed when it is received by the Feed Analysis Laboratory. Most feeds contain approximately 90% Dry Matter, or 10% moisture.
Total Digestible Nutrients (TDN)	A description of the energy content of level in the feed. Energy is required for essential body functions, growth, and production. The results are reported as a percentage of the feed.
Protein	Protein is required for tissue, bone, and antler growth, and for animal maintenance and production functions. The results are reported as a percentage of the feed.
Calcium	An important mineral required by muscle tissues, bone development and maintenance, as well as antler and milk production. The results are reported as a percentage of the feed.
Phosphorus	An essential mineral required for bone development and maintenance, antler and milk production, and is very important in reproduction. The results are reported as a percentage of the feed.

Suggested Minimum Nutrient Levels in Wapiti Diets (Dry Matter Basis)

	Bulls		**Cows (Gestating)**		**Cows (Lactating)**	
Nutrient (%)	Maintain	Antler Growth	12-24 weeks	24-36 weeks	0-6 weeks	6-12 weeks
TDN	51-53	53-55	56-58	58-60	63-65	60-62
Protein	8-10	10-12	10-12	12-14	14-16	12-14
Calcium	0.35	0.45	0.35	0.40	0.50	0.40
Phosphorus	0.25	0.35	0.25	0.35	0.40	0.35

	Calves		
	3-6 Month Old	6-9 Month Old	9-18 Month Old
TDN	67-69	63-65	58-60
Protein	18-20	16-18	12-14
Calcium	0.70	0.50	0.40
Phosphorus	0.65	0.45	0.35

Source: Watkins, 1991, Haigh and Hudson, 1993.

Nutrient Content of Concentrates (100% Dry Matter)

	DE (kcal/kg)	T.D.N. (%)	Protein (%)	Calcium (%)	Phosphorus (%)
Barley	3,500	82	12	0.06	0.36
Distillers Grains	3,200	73	35	0.10	0.46
Screening Pellets	3,200	72	13	0.14	0.32
Hulless Barley	3,800	86	13	0.07	0.40
Oats	3,300	76	11	0.07	0.37
Rye	3,700	84	13	0.06	0.34
Triticale	3,800	86	13	0.06	0.39
Wheat	3,900	89	14	0.07	0.39

Nutrient Content of Forages (100% Dry Matter)

	DE (kcal/kg)	T.D.N. (%)	Protein (%)	Calcium (%)	Phosphorus (%)
Alfalfa Hay (early)	2,700	61	18	1.63	0.22
Alfalfa cubes	2,700	61	17	1.56	0.21
Brome	2,500	57	13	0.36	0.34
Brome alfalfa	2,600	59	16	1.09	0.24
Crested wheatgrass	2,500	57	9	0.31	0.29
Dehy alfalfa pellets	2,900	67	19	1.56	0.22
Grass hay	2,300	53	8	0.29	0.21
Oak leaves (Korea)	2,500	58	12	1.26	0.12
Oat greenfeed	2,500	57	11	0.31	0.29
Slough hay	2,300	53	9	0.28	0.26
Barley straw	1,900	43	4	0.28	0.11

1 kg of T.D.N. equals 4409 kcal of DE

ME = 0.82 × DE

Values based on 100% dry matter.

Source: Saskatchewan Feed Resource Center

References:

Watkins, B. 1991. Nutrition of Rocky Mountain Elk, Part 1. Requirements for energy, fiber & protein. North American Elk Magazine, Spring 1991 ed.

Haigh, J.C. and Hudson, R.J. 1993. Farming Wapiti and Red Deer. Mosby-Year Book, Inc. St. Louis, Missouri.

Appendix V: Selecting Grass Varieties and Managing Pasture for Elk

(This bulletin was originally printed in 1995 as "Selecting Grass Varieties and Managing Pasture for Elk", Spring 1995 issue of "North American Elk", Dr. Dan Undersander, Forage Specialist, University of Wisconsin.)

***NOTE**: Figure 2 has been modified in order to reflect the growing conditions in Saskatchewan. The original bulletin reflected growing conditions for Wisconsin and many of the forage species listed in Figure 2 are not adapted for the Saskatchewan climate. No other portion of the original bulletin was modified.*

Pasture is the basic source of energy and protein for most grazing ruminants such as elk. While environment, especially rainfall, plays a large role in pasture productivity, pasture management can greatly reduce the environmental effects to provide a stable, quality feed supply. Further, within a given region, good pasture management may result in 200 to 300% more productivity than poor pasture management. It is important to realize that there is no single panacea (such as the "right" grass species) but that good pasture management is a combination of practices, including selecting the best grass or legume variety, that comes from knowledge of animal needs and the biology of pasture growth.

I would like to first consider elk nutritional needs (because it important to match pasture to animal needs), and then to consider plant growth.

Mature elk vary during the year in their nutritional needs as their physiological status and activity level changes. Figure 1 illustrates this seasonal change. Elk, as most other grazing animals, have the lowest need for energy over winter and the highest need for energy and nutrients at and following calving.

Good quantities of high quality forage at and following calving stimulate milk production for early calf growth and encourage cycling for breeding. Growing calves have an intermediate need for energy and nutrients between the two extremes mentioned for hinds. When animals have high needs for energy, it is important that they be fed adequate quantities of forage with high quality (high energy and protein contents). For example, a lactating hind may have all the 50% TDN (total digestible nutrient) forage she can eat and still not cycle because she is getting full before she has consumed the nutrients she needs. It is important to know and understand these relationships so that forage availability can be matched to animal needs.

Pasture plants tend to have a natural growth cycle that matches animal needs. As shown in Figure 2, pasture growth is greatest for cool

Figure 1. Monthly energy requirements of a young wapiti hind with a rut weight of 250 kg (550 lbs).

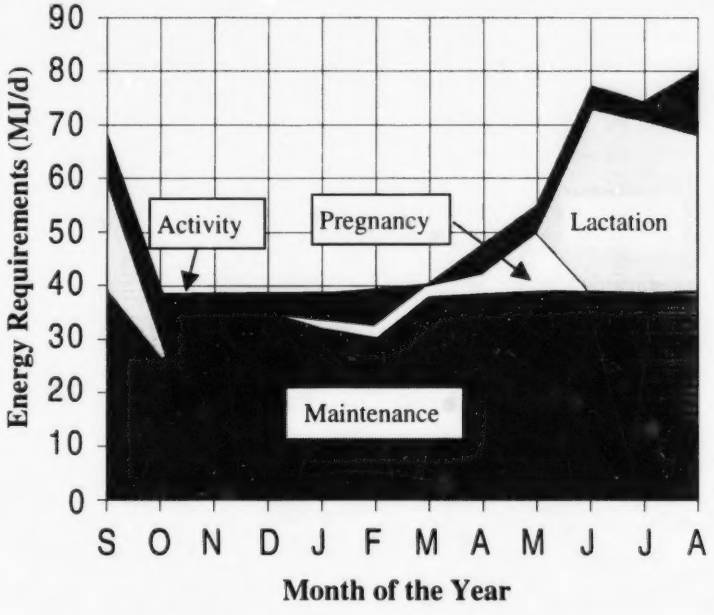
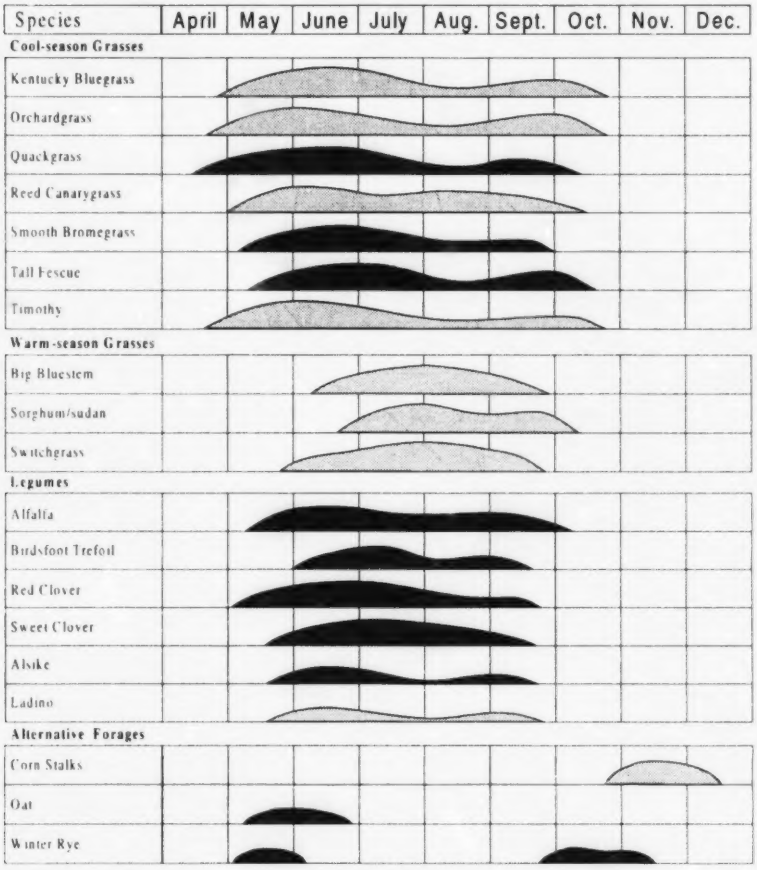
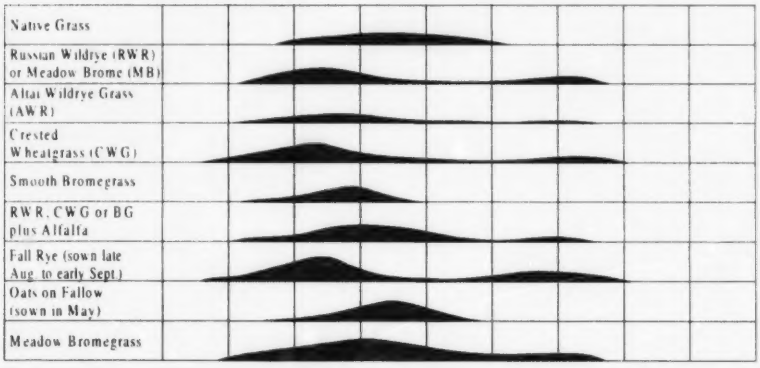


Figure 2. Seasonal growth patterns of forages in Wisconsin



Seasonal growth patterns of forages in Saskatchewan


Native Grass
Russian Wildrye (RWR) or Meadow Brome (MB)
Altai Wildrye Grass (AWR)
Crested Wheatgrass (CWG)
Smooth Bromegrass
RWR, CWG or BG plus Alfalfa
Fall Rye (sown late Aug. to early Sept.)
Oats on Fallow (sown in May)
Meadow Bromegrass

Note: Species indicated by shaded areas are not well suited to the Saskatchewan climate. The seasonal growth patterns of Saskatchewan forages was taken from the 2000 Saskatchewan Forage Crop Production Guide (SAF publication SUF0100)

season grasses in the spring when animal needs are greatest. These grasses grow best under cool temperatures and thus decline in production over summer and then produce fall growth if adequate nutrients are present in the soil. Warm season grasses tend to start much later in the spring, grow during the warmer summer periods and quit growing in late summer. Legumes tend to start slightly later than cool season grasses but grow more continuously over summer.

Another consideration in pasture is the quality differences that occur over time and changes among species. All pasture species are high in quality at immature stages. This quality declines as the plant species mature. Leaves of most forages are high in quality and stems have lower quality. Stems also decline rapidly in quality while leaves tend to maintain their quality better. This means that pasture quality tends to be highest in the spring with the flush of new growth and is high until stems and heads appear.

At immature stages all grasses and legumes are high in quality. As plants begin to mature, some grasses maintain their quality better than others and legumes generally have higher forage quality than grasses. Regrowth after heading tends to be leafy for most grass species and higher in quality again than during the grass heading stage.

Knowing these patterns of forage growth and changes in forage quality means that a good manager can use several species within a pasture program to provide a season-long supply of good quality forage. This can be

accomplished by mixing legumes and cool season grasses within a pasture to provide a reasonably stable supply of quality forage. Warm season grasses are not normally mixed with cool season grasses because their growth habits are so different than one or the other eventually predominates depending on the climate.

Thus in areas with long, warm summers, separate cool season grass and warm season grass pastures are needed to provide season-long forage supply. Legumes tend to be most compatible with cool season grasses and are seldom mixed with warm season grasses.

A major limiting factor for most pasture production is soil fertility. Grasses need large amounts of nitrogen. Legumes need relatively large amounts of potassium. Both need phosphorous and several other nutrients. A soil test will indicate the levels of nutrients and recommend any amounts needed.

Some soils may have adequate levels of many nutrients but most will need nitrogen for grass growth. This nitrogen can be applied any time during the growing season that growth is desired. Standard systems recommend nitrogen fertilization for spring growth and a second application in late summer for fall growth of cool season grasses. The spring application should be adjusted according to forage needs, i.e. if more than adequate forage is available and no hay is made, nitrogen fertilization may be reduced or skipped in favor of the late summer application. Pastures with over 30% legume generally have reduced need for nitrogen fertilizer.

The best way to use forages to provide the needed quality and tonnage of forage is in a rotational grazing system. Rotational grazing systems result in better pasture and animal performance because:

- Pastures are rested, allowing them to recover and produce more forage
- Animals are forced to consume more of the available forage before moving on to the next pasture.

Forage plants tend to grow slowly when young but increase dry matter production per acre as they get larger because the plants have more leaf area and can photosynthesize more energy for growth (Figure 3). This higher growth rate must be balanced against reduced forage quality as the plants mature.

Thus, tall growing grasses should be grazed at 8 to 12 inches height and then rested for regrowth. When elk have too much pasture available to them, they tend to graze a spot and then keep regrazing it because the most recently grazed area has the youngest, most tender forage. This spot grazing results in lost pasture yield because the regrazed areas are kept short so that plant growth rate is low. The remainder of the pasture is also lost because it is allowed to mature and lose quality.

With the above management tips, all grass species will perform better. However, certain grass species and varieties are best adapted to certain soil types and management pattern.

Figure 3. Forage growth curve

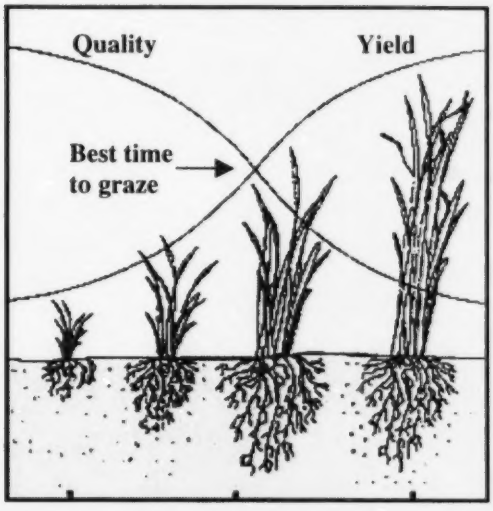
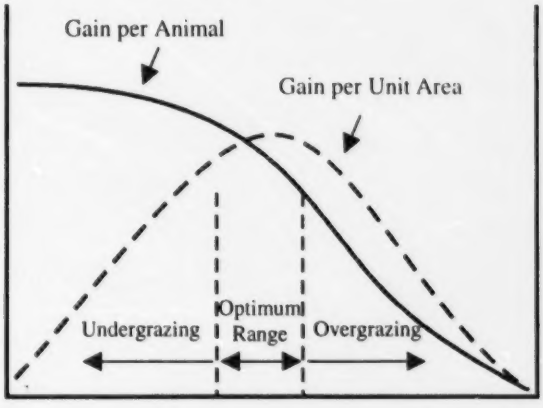


Figure 4. Relationship of Gain Per Animal to Gain Per Acre



Appendix VI: Elk Carcass Weights and Meat Obtained

The six bull elk studied had an average field dressed weight of 437 lb. They ranged in age (determined by wear of mandibular cheek teeth) from 1.5 to 9.5 years with four bulls being 2.5 or 3.5 years of age. The six cows averaged 339 lb. and were 2.5 to 5.5 years old. Field dressed carcass weight included the head and hide but the legs were removed at the knees and hocks, and all contents of the abdominal and thoracic cavities, including the entire gullet and windpipe were removed. Field dressed weights, which are sometimes referred to as hog dressed weights, are near average for the ages given. Hunter (1970) lists the average hog dressed weights of 2-year-old, 4-year-old and mature elk as 263, 316 and 357 lb, respectively, for cows and 286, 346 and 521 lb., respectively, for bulls. Quimby and Johnson (1951) stated that the mature elk they studied were slightly heavier than those of Hunter's and that the viscera made up 32 and 33% of the whole carcass weight for males and females, respectively. Their figures for converting whole weight to field dressed weight were used in Table 1. The other factors in Table 1 are based upon data obtained on bull elk in the present study.

Because of a higher fat content, lower evaporation loss, and fewer wounds resulting from fighting, packaged cuts for cow elk are often slightly higher on a percentage basis than those shown in Table 1 for bull elk (54% of field dressed weight). Loss due to gunshot will also cause the packaged cut figures to vary. Elk shot once in the head or brisket will have higher yields of packaged cuts than normal, while those shot in the legs or shoulders will have lower yields of packaged cuts. All edible lean from every cut was included in the packaged cut weights. If the head is cut off near the shoulders instead of at the atlas joint, or if some cuts such as the flank or plate are discarded, the packaged cut yield will be lower.

Boneless packaged cut figures in Table 1 are almost identical to those obtained by B.T. Killion (personal communication) owner of Dubois Cold Storage in Dubois, Wyoming. He picked 56 elk carcasses at random which were delivered to the plant for processing. The clean dressed weight (field dressed weight minus the head and hide) of these carcasses, the great majority of which were bulls, was 305 lb. The weight of boneless cuts was 159 lb. which included 66 lb. of steaks, 20

Table 1. Weight conversion figures for bull elk.

Weight example	Factor
Whole weight – 592 lb.[a]	1.48 × field dressed weight
Field dressed weight – 400 lb. (viscera removed)	0.675 × whole weight
Clean dressed weight – 332 lb. (skin and head removed)	0.83 × field dressed weight
Packaged retail cuts – 216 lb. (bone left in leg, loin, rib and shoulder cuts)	0.54 × field dressed weight
Packaged cuts (all boneless) – 172 lb.	0.43 × field dressed weight

[a] Whole weight is used in place of live weight. Whole weight is slightly less than live weight because it does not take into account blood loss at time of kill. Blood loss on slaughtered steers ranges from 3.04 to 3.70% of the whole weight (Ramsey et al., 1965). According to Reichert and Brown (1909), these amounts are less than half of the total blood in the body.

lb. of roasts and 64 lb. of ground elk by his cutting method. Weight of packaged retail cuts or packaged boneless cuts can be increased if beef or pork fat is added to the ground meat or if products such as salami are made. Elk meat often has 25% fat and other ingredients added to it when it is made into salami or similar products.

A more complete breakdown of losses from the field dressed weight to packaged retain cut weight is given in Table 2. Some aging loss and some cutting and trimming loss can be eliminated if the aging period is reduced to less than 14 days. This in turn would increase the retail cut weight.

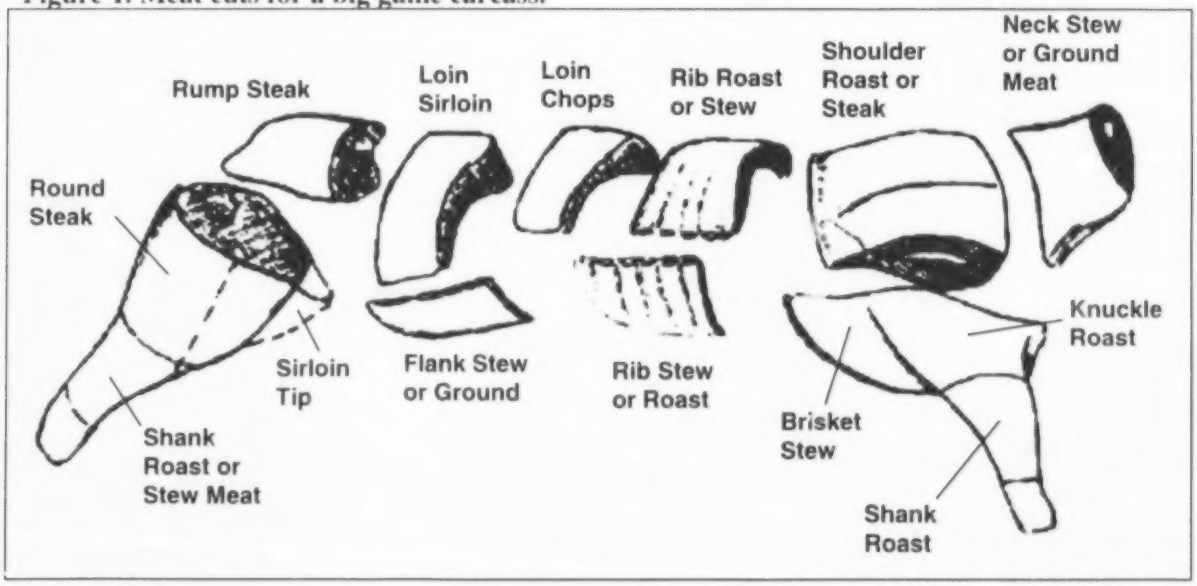
Table 2. Average yields and weight losses from various harvested big game animals.

		Losses				Packaged cuts with bones left in leg, loin, rib and shoulder cuts	Packaged cuts without bones	Percent of field-dressed weight of packaged cuts without bones
Big Game Animal	Field-dressed weight (lbs.)*	Head (lbs.)	Skin (lbs.)	Aging (lbs.)	Cutting & Trimming (lbs.)			
Pronghorn male	76.7	7.1	5.9	7.0	12.5	44.2	36.0	47 %
Pronghorn female	68.5	5.3	5.1	6.7	12.6	38.8	31.6	46 %
Mule Deer male	113.7	8.4	9.3	5.1	25.0	65.9	54.6	48 %
Mule Deer female	92.6	5.7	8.0	5.7	20.7	52.5	44.4	48 %
Elk male	437.0	39.0	34.0	14.0	114.0	236.0	188.0	43 %
Elk female	339.0	19.0	26.0	12.0	87.0	195.0	146.0	43 %

* Eviscerated carcass with only the legs cut off at lower knees and hocks.

Source: Field *et al.* 1972, 1973a, 1973b

Figure 1. Meat cuts for a big game carcass.



Appendix VII: References and Information Sources

Additional Information

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J.C. Haigh & R.J. Hudson
1993. Mosby-Year Book, Inc.
St. Louis, Missouri

Game Farming Practice
Notes for the Game Farming Industry
J.C. Haigh
University of Saskatchewan
Saskatoon, SK

Pasture and Forages for Wapiti
written by Lorne Klein
Grazing & Pasture Technology Program
Box 4752
Regina, SK S4P 3Y4
Telephone: (306) 757-9499
Fax: (306) 569-8799

Fencing for Elk & Deer
written by Ray Nixdorf
Saskatchewan Agriculture & Food
FarmFacts SUSDF0399

Elk Farming Handbook, 2000
Ian Thorleifson, Tony Pearse & Bruce Friedel
available from Viking Livestock
37 Lafonde Crescent
St. Albert, AB T8N 2N7

Information Sources

Saskatchewan Elk Breeders Association
Box 1094
Regina, SK S4P 3B2
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